Vol. 1118 Number 1

OFFICIAL GAZETTE

of the

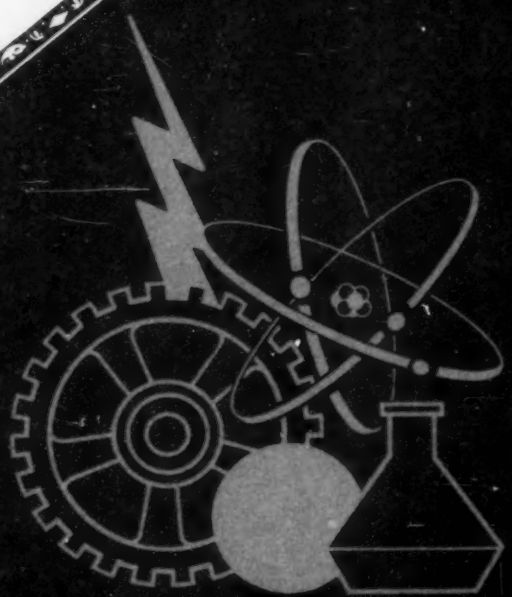
UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

PATENTS

September 4, 1990



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

September 4, 1990 Volume 1118 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Apr. 30, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 1, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,689,828 through 4,691,386
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 30, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,400,829 through 4,402,090
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 24, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,335,539	06/255,699	6/22/82
4,335,543	06/236,882	6/22/82
4,335,552	06/221,882	6/22/82
4,335,562	06/220,426	6/22/82
4,335,741	06/233,513	6/22/82
4,335,755	06/252,517	6/22/82
4,335,756	06/226,657	6/22/82
4,335,965	06/217,286	6/22/82
4,335,967	06/240,332	6/22/82
4,335,973	06/246,070	6/22/82
4,336,069	06/235,190	6/22/82
4,336,073	06/293,979	6/22/82
4,336,088	06/258,222	6/22/82
4,336,094	06/268,198	6/22/82
4,336,099	06/241,280	6/22/82
4,336,110	06/231,794	6/22/82
4,336,141	06/230,710	6/22/82
4,336,142	06/240,568	6/22/82
4,336,200	06/229,257	6/22/82
4,336,225	06/257,176	6/22/82
4,336,253	06/242,792	6/22/82
4,336,261	06/216,480	6/22/82
4,336,266	06/240,334	6/22/82
4,336,268	06/228,793	6/22/82
4,336,269	06/237,569	6/22/82
4,336,290	06/254,005	6/22/82
4,336,326	06/252,560	6/22/82
4,336,327	06/217,302	6/22/82
4,336,346	06/252,802	6/22/82
4,336,376	06/234,896	6/22/82
4,336,391	06/251,068	6/22/82
4,336,403	06/228,284	6/22/82
4,336,409	06/255,250	6/22/82
4,336,491	06/232,186	6/22/82
4,596,059	06/562,184	6/24/86
4,596,061	06/693,630	6/24/86
4,596,063	06/712,004	6/24/86
4,596,073	06/571,010	6/24/86
4,596,085	06/627,568	6/24/86
4,596,087	06/589,557	6/24/86
4,596,088	06/671,827	6/24/86
4,596,094	06/509,529	6/24/86
4,596,100	06/499,800	6/24/86
4,596,101	06/623,509	6/24/86
4,596,122	06/429,787	6/24/86
4,596,129	06/544,997	6/24/86
4,596,137	06/710,051	6/24/86
4,596,142	06/626,725	6/24/86
4,596,147	06/690,623	6/24/86
4,596,151	06/756,535	6/24/86
4,596,158	06/455,667	6/24/86
4,596,166	06/736,947	6/24/86
4,596,168	06/694,880	6/24/86
4,596,174	06/687,476	6/24/86
4,596,179	06/624,121	6/24/86
4,596,187	06/627,930	6/24/86
4,596,195	06/622,010	6/24/86
4,596,197	06/690,661	6/24/86
4,596,206	06/614,477	6/24/86
4,596,211	06/626,159	6/24/86
4,596,212	06/654,781	6/24/86
4,596,215	06/755,832	6/24/86
4,596,231	06/671,563	6/24/86
4,596,232	06/699,412	6/24/86
4,596,241	06/565,234	6/24/86
4,596,249	06/517,276	6/24/86
4,596,256	06/574,009	6/24/86
4,596,266	06/656,279	6/24/86
4,596,274	06/704,193	6/24/86
4,596,279	06/587,053	6/24/86
4,596,284	06/664,790	6/24/86
4,596,286	06/658,723	6/24/86
4,596,291	06/503,326	6/24/86
4,596,297	06/661,596	6/24/86
4,596,307	06/603,514	6/24/86
4,596,331	06/523,038	6/24/86
4,596,332	06/623,122	6/24/86
4,596,334	06/528,214	6/24/86
4,596,346	06/695,379	6/24/86
4,596,353	06/635,820	6/24/86
4,596,365	06/675,188	6/24/86
4,596,369	06/569,606	6/24/86
4,596,372	06/686,490	6/24/86
4,596,375	06/625,341	6/24/86
4,596,384	06/232,398	6/24/86
4,596,386	06/521,929	6/24/86
4,596,387	06/675,550	6/24/86
4,596,388	06/568,409	6/24/86
4,596,392	06/519,133	6/24/86

Patent Number	Serial Number	Issue Date
4,596,398	06/569,742	6/24/86
4,596,404	06/690,014	6/24/86
4,596,413	06/744,247	6/24/86
4,596,417	06/758,087	6/24/86
4,596,418	06/676,212	6/24/86
4,596,423	06/722,675	6/24/86
4,596,427	06/570,086	6/24/86
4,596,430	06/625,135	6/24/86
4,596,431	06/699,799	6/24/86
4,596,437	06/740,454	6/24/86
4,596,443	06/724,048	6/24/86
4,596,450	06/599,461	6/24/86
4,596,462	06/472,421	6/24/86
4,596,480	06/661,682	6/24/86
4,596,484	06/657,933	6/24/86
4,596,487	06/661,524	6/24/86
4,596,489	06/650,906	6/24/86
4,596,515	06/530,352	6/24/86
4,596,523	06/750,924	6/24/86
4,596,529	06/763,522	6/24/86
4,596,533	06/708,879	6/24/86
4,596,540	06/754,717	6/24/86
4,596,557	06/624,777	6/24/86
4,596,560	06/440,954	6/24/86
4,596,562	06/701,966	6/24/86
4,596,565	06/701,745	6/24/86
4,596,569	06/701,394	6/24/86
4,596,580	06/673,495	6/24/86
4,596,583	06/550,741	6/24/86
4,596,599	06/560,725	6/24/86
4,596,603	06/714,314	6/24/86
4,596,610	06/573,537	6/24/86
4,596,614	06/667,923	6/24/86
4,569,628	06/643,066	6/24/86
4,596,639	06/434,737	6/24/86
4,596,643	06/720,985	6/24/86
4,596,662	06/620,214	6/24/86
4,596,669	06/443,606	6/24/86
4,596,671	06/656,659	6/24/86
4,596,674	06/649,388	6/24/86
4,596,683	06/766,150	6/24/86
4,596,698	06/415,832	6/24/86
4,596,711	06/553,057	6/24/86
4,596,712	06/383,625	6/24/86
4,596,725	06/729,324	6/24/86
4,596,753	06/726,758	6/24/86
4,596,754	06/726,363	6/24/86
4,596,760	06/646,047	6/24/86
4,596,790	06/662,060	6/24/86
4,596,791	06/690,387	6/24/86
4,596,796	06/648,986	6/24/86
4,596,799	06/696,295	6/24/86
4,596,811	06/543,132	6/24/86
4,596,813	06/439,242	6/24/86
4,596,815	06/614,598	6/24/86
4,596,816	06/485,433	6/24/86
4,596,818	06/580,691	6/24/86
4,596,819	06/573,233	6/24/86
4,596,829	06/571,488	6/24/86
4,596,838	06/739,251	6/24/86
4,596,858	06/622,417	6/24/86
4,596,863	06/607,103	6/24/86
4,596,879	06/753,493	6/24/86
4,596,881	06/656,380	6/24/86
4,596,892	06/725,024	6/24/86
4,596,901	06/579,779	6/24/86
4,596,912	06/703,297	6/24/86
4,596,933	06/662,656	6/24/86
4,596,944	06/594,236	6/24/86
4,596,979	06/611,500	6/24/86
4,596,980	06/524,983	6/24/86
4,596,988	06/503,240	6/24/86
4,596,989	06/544,445	6/24/86
4,597,000	06/419,888	6/24/86
4,597,004	06/707,795	6/24/86
4,597,009	06/620,055	6/24/86
4,597,011	06/534,732	6/24/86
4,597,013	06/521,969	6/24/86
4,597,043	06/388,907	6/24/86
4,597,071	06/498,172	6/24/86
4,597,072	06/621,906	6/24/86
4,597,074	06/517,849	6/24/86
4,597,091	06/415,671	6/24/86
4,597,095	06/603,815	6/24/86
4,597,099	06/586,977	6/24/86
4,597,106	06/723,078	6/24/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fee which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,465,956	06/469,957	8/14/84	2/25/83	7/31/90
4,533,831	06/477,375	8/05/85	3/21/83	7/30/90
4,534,609	06/524,987	8/13/85	8/22/83	7/30/90
4,542,969	06/429,343	9/24/85	9/30/82	7/30/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

4,332,815, Re. S. N. 07/558,640, Filed July 27, 1990, Cl. 424/742, INSECTICIDAL PERHALOALKYLVINYLCYCLOPROPANE CARBOXYLATES, John F. Engel, Owner of Record: *FMC Corp., Philadelphia, Pa.*, Attorney or Agent: Francis A. Paintin, Ex. Gp.: 125

4,458,627, Re. S. N. 07/557,115, Filed July 25, 1990, Cl. 118/657, DEVELOPING APPARATUS FOR ELECTROSTATIC IMAGE, Nagao Hosono, et al., Owner of Record: *Inventor*, Attorney or Agent: John A. Krause, Ex. Gp.: 215

4,701,026, Re. S. N. 07/468,461, Filed January 22, 1990, Cl. 350/333, METHOD AND CIRCUITS FOR DRIVING A HARD LIQUID CRYSTAL DISPLAY DEVICE, Minoru Yazaki, Owner of Record: *Seiko Epson Kabushiki Kaisha, Tokyo Japan*, Attorney or Agent: Michael I. Wolfson, Ex. Gp.: 254

4,721,117, Re. S. N. 07/471,226, Filed January 26, 1990, Cl. 128/772, FORSIONALLY STABLIZED GUIDE WIRE WITH OUTER JACKET, Craig E. Mar, et al., Owner of Record: *Advanced Cardiovascular Systems, Inc., Mountain View, Calif.*, Attorney or Agent: Edward J. Lynch, Ex. Gp.: 335

4,737,400, Re. S. N. 07/440,885, Filed November 22, 1989, Cl. 428/230, METHOD FOR MAKING ELASTIC BANDAGING MATERIAL, Charles J. Edison, et al., Owner of Record: *Inventor*, Attorney or Agent: Peter C. Schechter, Ex. Gp.: 154

4,746,196, Re. S. N. 07/527,879, Filed May 24, 1990, Cl. 350/332, MULTIPLEXED DRIVING METHOD FOR A LIGHT SHUTTERING ELEMENT ENOKITUBG FERROELECTRIC LIQUID CRYSTAL, Tajai Ynedam, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Melvin Kraus, Ex. Gp.: 254

4,758,891, Re. S. N. 07/554,640, Filed July 17, 1990, Cl. 358/166, METHOD AND APPARATUS FOR IMPROVING THE RISE AND FALL TIME OF A VIDEO SIGNAL, James E. Hitchcock, et al., Owner of Record: *North American Philips Corp., New York, N.Y.*, Attorney or Agent: Michail E. Marion, Ex. Gp.: 262

4,760,022, Re. S. N. 07/556,148, Filed July 23, 1990, Cl.435/320, STABLIZED PLASMIDS, Soren Molin, et al., Owner of Record: *A/S Asfred Benzon, Copenhagen, Denmark*, Attorney or Agent: Iver P. Cooper, Ex. Gp.: 185

4,793,669, Re. S. N. 07/558,597, Filed July 27, 1990, Cl. 350/1.6, MULTILAYER OPTICAL FILTER FOR PRODUCING COLORED RELECTED LIGHT AND NEUTRAL TRANSMISSION, Bruce E. Perilloux, Owner of Record: *Coherent, Inc., San Fransico, Calif.*, Attorney or Agent: Philip A. Girard, Ex. Gp.: 257

4,834,107, Re. S. N. 07/556,101, Filed July 20, 1990, Cl. 128/668, HEART-RELATED PARAMETERS MONITORING APPARATUS, Glenfield Warner, Owner of Record: *Sylvia Warner and Priyamvada Sankar, Quebec, Canada*, Attorney or Agent: Roger A. Vankirk, Ex. Gp.: 335

4,835,218, Re. S. N. 07/557,113, Filed July 25, 1990, Cl. 525/98, COMPOSITION FOR DRAWN FILM, COLD DRAWN FILM MADE OF SAID COMPOSITION AND PROCESS FOR MANUACTURE OF SAID FILM, Isao Yoshumura, et al., Owner of Record: *Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: Watson T. Scott, Ex. Gp.: 151

4,841,170, Re. S. N. 07/538,932, Filed June 15, 1990, Cl. 307/310, TEMERATURE CONTROLLED HYBRID ASSEMBLY, Larry E. Eccleston, Owner of Record: *John Fluke Manufacturing Co., Inc., Everett, Wash.*, Attorney or Agent: Richard A. Koske, Ex. Gp.: 254

4,893,229, Re. S. N. 07/559,220, Filed July 30, 1990, Cl. 364/140, COMPUTERIZED CAR WASH CONTROLLER SYSTEM, Kevin Dertick, Owner of Record: *Innovative Control Systems, Inc., Allentown, Pa.*, Attorney or Agent: Sanford J. Piltch, Ex. Gp.: 236

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,826,728, Reexam. No. 90/002,091, Requested July 20, 1990, Cl. 204/192.27, TRANSPARENT ARTICLE HAVING REDUCED SOLAR RADIATION TRANSMITTANCE AND METHOD OF MAKING THE SAME, Douglas L. Chambers, et al., Owner of Record: *The Boc Group, Windelsham Surrey, England*, Attorney or Agent: David A. Dragert, New Providence, R. I., Ex. Gp.: 112, Requester: Donald C. Lepiane, PPG Industries, Pittsburg, Pa.

4,615,385, Reexam. No. 90/002,093, Requested July 23, 1990, Cl. 165/175, HEAT EXCHANGER, Zalman P. Saperstein, et al., Owner of Record: *Modine Manufacturing Co., Racine, Wis.*, Attorney or Agent: Wood, Dalton, Phillips, Mason & Rowe, Chicago, Ill., Ex. Gp.: 347, Requester: Jordon M. Meschkow, Phoenix, Ariz.

4,663,071, Reexam. No. 90/002,092, Requested July 20, 1990, Cl. 252/174.19, ETHER CARBOXYLATE DETERGENT BUILDERS AND PROCESS FOR THEIR PREPARATION, Rodney D. Bush, et al., Owner of Record: *Proctor & Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Leonard W. Lewis, Cincinnati, Ohio, Ex. Gp.: 115, Requester: Owner

4,751,528, Reexam. No. 90/002,089, Requested July 13, 1990, Cl. 346/140R, PLATEN ARRANGEMENT FOR HOT MELT INK JET APPARATUS, Charles W. Spearley, et al., Owner of Record: *Spectra Inc., Hanover, N. H.*, Attorney or Agent: Francis J. Hone, Brambaugh, Graves, et al., Ex. Gp.: 216, Requester: Stuart Lubitz, Spensley, Horn, Jubas & Lubitz, Los Angles, Calif.

4,820,091, Reexam. No. 90/002,088, Requested July 13, 1990, Cl. 408/197, TOOL AND METHOD FOR FORMING PANEL JOINTS, John T. Koski, Owner of Record: *Inventor, Battle Creek, Mich.*, Attorney or Agent: Irvin L. Van Groh, Groh, Vanophem, et al., Requester: John K. Knoble, Minneapolis, Minn.

4,905,698, Reexam. No. 90/002,090, Requested July 19, 1990, Cl. 128/653R, METHOD AND APPARATUS FOR CATHETER LOCATION DETERMINATION, Clair L. Strohl, Jr., et al., Owner of Record: *Pharmacia Deltec, St. Paul, Minn.*, Attorney or Agent: A. James Nelson, Merchant & Gould, Ex. Gp.: 335, Requester: Owner

Errata

"All reference to Patent No. 4,906,743 to Michele Caruso et al. of Milan, Italy for `4-DEMETHOXY-4-AMINO-ANTHRACYCLINES' appearing in the Official Gazette of March 6, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,914,467 to Satoshi Takami et al. of Tokyo, Japan for `INTERCHANGEABLE CAMERA AND INTERCHANGEABLE' appearing in the Official Gazette of April 3, 1990 shouold be deleteed since no patent was granted."

"All reference to Patent No. 4,921,145 to Jimmey L. Crossley et al. of Iowa for `ICE CREAM EJECTOR' appearing in the Official Gazette of May 1, 1990 should be deleteed since no patent was granted."

"All reference to Patent No. 4,926,494 to Thomas Potter et al. of Los Alamitos, Calif. for `VEHICLE COMMUNICATION SYSTEM USING EXISTING ROADWAY LOOPS' appearing in Official Gazette of May 15, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,926,939 to Lindley Baugh of Houston, Tex. for `HYDRAULICALLY ACTUATED LINER HANGER' appearing on the Official Gazette of May 22, should be deleted since no patent was granted."

"All reference to Patent No. 4,939,323 to Frankie H. Allen et al. of Georgia, for `CIRCUIT BREAKER CONTACT ASSEMBLY' appearing in the Official Gazette of July 3, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,944,363 to Jon Harwood of Ohio for `STAMP FORMED MUFFLER' appearing in the Official Gazette of July 31, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,932,055 to Ron D. Katznelson of Calif. for `METERING RETRIEVAL OF ENCRYPTED DATA STORED IN CUSTOMER DATA' appearing in the Official Gazette of June 5, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,933,343 to Cott et al. of Chesire, Conn. for `METHOD OF TREATMENT OR MELANCHOLIC DEPRESSION' appearing in the Official Gazette of June 12, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,945,615 to James R. Anthony et al. for `BELT WITH INTERLOCKING DUAL TONGUE' appearing in the Official Gazette of August 7, 1990 should be deleted since no patent was granted."

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on January 31, 1990 fron the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names began with P through S. Enclosed with the letter was a data sheet which should have been completed and returned to OED as soon as possible. All data sheets returned to OED were acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with P through S and you did not receive a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Shirley B. Rasheed at (703) 557-1728.

June 26, 1990 CAMERON WEIFENBACH, *Director*
Office of Enrollment & Discipline

PATENT NOTICES

Certificates of Correction For Week of September 4, 1990

D. 303,939	4,833,196	4,857,546	4,868,149
4,429,814	4,833,693	4,857,997	4,868,552
4,517,284	4,833,939	4,858,020	4,869,485
4,601,380	4,835,298	4,858,928	4,869,552
4,609,745	4,835,964	4,859,024	4,869,740
4,645,815	4,836,093	4,859,253	4,869,906
4,654,669	4,836,733	4,859,530	4,869,913
4,692,141	4,837,074	4,859,719	4,870,031
4,715,999	4,837,287	4,859,870	4,870,132
4,717,438	4,837,481	4,859,876	4,870,259
4,718,131	4,837,723	4,860,134	4,870,603
4,723,520	4,839,176	4,860,351	4,870,888
4,731,794	4,839,815	4,862,157	4,871,014
4,764,211	4,841,016	4,862,535	4,871,328
4,766,168	4,841,265	4,862,798	4,871,463
4,789,874	4,841,708	4,862,801	4,871,845
4,791,120	4,842,590	4,862,931	4,871,948
4,792,701	4,842,689	4,863,199	4,872,201
4,793,152	4,842,862	4,863,228	4,872,439
4,793,407	4,843,111	4,863,441	4,872,914
4,793,749	4,843,213	4,863,520	4,873,217
4,799,440	4,843,502	4,863,722	4,873,284
4,799,979	4,844,408	4,863,725	4,873,408
4,803,951	4,844,617	4,863,833	4,873,605
4,804,540	4,844,680	4,864,094	4,873,640
4,804,566	4,844,950	4,864,142	4,874,456
4,810,305	4,845,092	4,864,211	4,874,734
4,813,478	4,848,039	4,865,274	4,874,765
4,814,834	4,848,727	4,865,480	4,874,863
4,819,502	4,849,402	4,865,567	4,878,172
4,828,501	4,851,433	4,865,794	4,878,216
4,829,342	4,851,704	4,865,865	4,878,233
4,829,672	4,852,213	4,866,725	4,878,347
4,830,240	4,852,433	4,867,171	4,879,498
4,831,000	4,853,209	4,867,348	4,884,810
4,831,282	4,854,434	4,867,369	4,909,689
4,831,817	4,855,394	4,867,416	4,910,651
4,832,239	4,856,093	4,867,471	4,929,889
4,832,796	4,856,374	4,867,794	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Washington, D.C. 20231

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Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue.
Box ITU	All Intent to Use documents excluding the initial application and amendments to allege use.
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Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
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Box Assignments	All assignment documents except those filed in new patent applications.
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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
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New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF July 14, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	-/-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	4-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-20-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	3-8-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	8-22-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	4-22-88
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	1-5-87
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-3-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	5-5-89

Expiration of patents: The patents within the range of numbers indicated below expire during July 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,742,517 to 3,750,191 inclusive
Plant Patents	3,370 to 3,384 inclusive

O. G. Notice

Introductory Training Session
for
Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures

The Patent and Trademark Office (PTO) is interested in identifying participants for an introductory training session directed to the requirements for patent applications containing nucleotide sequence and/or amino acid sequence disclosures. The requirements are contained in the final rules, published in the *Federal Register*, 55 FR 18230 (May 1, 1990), and in the *Official Gazette*, 1114 O.G. 29 (May 15, 1990). The training session will focus on the requirements of the final rules, especially the submission of computer readable forms. The introductory training session will assume familiarity with the final rules as well as the accompanying discussion and comments/responses. The introductory training session will be open to all interested persons; registration to practice before the PTO is not a requirement for participation. The introductory training session will be held on Friday, September 14, 1990 from 1:00 p.m. until 4:00 p.m.in the PTO's Patent Academy - Crystal Park 1 - Room 501.

Requests to participate in the introductory training session should be made in writing and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Lois E. Boland; Special Program Examiner, Office of the Assistant Commissioner for Patents - Crystal Park 2, Suite 919. Capacity is limited and, as such, additional sessions will be scheduled as needed. Any questions about the introductory training session should be directed to Lois E. Boland, by telephone, at (703) 557-8384.

8/21/90
Date

James E. Denny
Acting Assistant Commissioner
for Patents

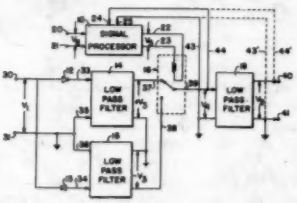
1118 OG 12

REEXAMINATIONS

SEPTEMBER 4, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,042,890 (1346th)
HIGH EFFICIENCY ELECTRICAL POWER CONDITIONER
Joseph S. Eckerle, Star Route 2, La Honda, Calif. 94020
Reexamination Request No. 90/000,749, Mar. 28, 1985.
Reexamination Certificate for Patent No. 4,042,890, issued Aug. 16, 1977, Ser. No. 686,332, May 14, 1976.
Filed Mar. 28, 1985, Ser. No. 686,332
The portion of the term of this patent subsequent to Mar. 16, 1994, has been disclaimed.
Int. Cl.[5] H03F *21/00*
U.S. Cl. 330—207 A



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–16 are cancelled.

[1. A high efficiency power conditioner for providing power amplification of relatively low power input signals, said power conditioner comprising:

power input terminal means adapted to be coupled to an AC voltage source of electrical power;

high power signal output terminal means adapted to be coupled to a utilization device;

means coupled to said power input terminal means for converting AC voltages supplied thereto to first and second relatively high DC voltages of different levels, said converting means having first and second output terminals for said first and second relatively high DC voltages, respectively;

controllable switch means having first and second power input terminals coupled respectively to said first and second output terminals of said converting means, an output terminal coupled to said high power signal output terminal means and a control input terminal, said switch means including means responsive to signals present on said control input terminal for alternately coupling said first and second DC voltages of different levels to said output terminal thereof; and

signal processing means having a first input adapted to be coupled to a source of said relatively low power input control signals, a second input coupled to said high power signal output terminal as a feedback signal path, and an output terminal coupled to said control input terminal of said switch means, said signal processor including means for generating relatively low power control signals from said input control signals and a portion of those signals present on the feedback signal path for controlling the state of said switch means, said switch means alternately coupling said first and second DC voltages of different levels to said output terminal thereof in response to said relatively low power control signals from said signal processing means.]

B1 4,539,131 (1347th)
SOLID DETERGENT COMPOSITION CONTAINING SODIUM PERBORATE MONOHYDRATE HAVING SPECIFIED SURFACE AREA
Peter F. Garner-Gray, Preston, England, assignor to Lever Brothers Company, New York, N.Y.
Reexamination Request No. 90/001,158, Jan. 30, 1987.
Reexamination Certificate for Patent No. 4,539,131, issued Sep. 3, 1985, Ser. No. 501,586, Jun. 6, 1983.
Filed Jan. 30, 1987, Ser. No. 501,586
Claims priority, application United Kingdom, Jun. 25, 1982, 8217537; Sep. 24, 1982, 8227308
Int. Cl.[5] C11D *7/54, 7/14, 7/18, 3/395*
U.S. Cl. 252—99

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–11 are cancelled.

[1. A solid detergent composition comprising:

(a) from 6 to 40% of a detergent active material;

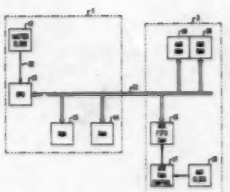
(b) from 5 to 60% of an alkalimetal aluminosilicate material as a detergency builder;

from 2 to 50% of sodium perborate monohydrate having the empirical formula:

$$NaBO_2.HO_2$$

in particulate form having a specific surface area of at least 5.89 m^2/g.]

B1 4,763,333 (1348th)
WORK-SAVING SYSTEM FOR PREVENTING LOSS IN A COMPUTER DUE TO POWER INTERRUPTION
Kerry Byrd, Falls Church, Va., assignor to University Vectors Corporation, Washington, D.C.
Reexamination Request No. 90/001,924, Jan. 16, 1990.
Reexamination Certificate for Patent No. 4,763,333, issued Aug. 9, 1988, Ser. No. 894,570, Aug. 8, 1986.
Filed Jan. 16, 1990, Ser. No. 894,570
Int. Cl.[5] G06F *11/00, 13/00*
U.S. Cl. 371—66



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–18 is confirmed.

1. In a digital computer having a central processing unit (CPU) driven by an operating system environment external to the CPU and volatile random-access memory (RAM), a data protection system for preventing an unintentional loss due to

an interruption of a main power supply of the computer's application program and operating system stored in RAM and the CPU's state, comprising:

means for supplying electric power to the computer and the data protection system;

means for monitoring the main electric power supply and for generating a signal indicative of an interruption thereof;

means for directing an operation of the computer and for conserving power to be supplied by the power supply means, the directing means being connected to the CPU, being responsive to the interruption signal, including an interrupt program stored in a non-volatile memory, and selectively enabling the power supply means to supply power to the computer; and

means for storing the application program and operating system stored in the RAM and the CPU's state, the storing means being responsive to the directing means.

B1 4,780,589 (1349th)

ROLLER ELECTRODES FOR ELECTRIC-RESISTANCE WELDING MACHINE

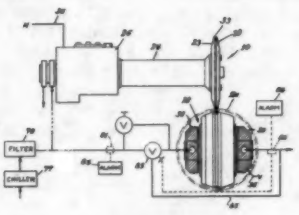
Joseph R. Davies, 220 W. Haven, New Lenox, Ill. 60451

Reexamination Request No. 90/001,821, Aug. 10, 1989.
Reexamination Certificate for Patent No. 4,780,589, issued Oct. 25, 1988, Ser. No. 53,375, May 22, 1987.
Filed Aug. 10, 1989, Ser. No. 53,375
Int. Cl.[5] B23K *11/06*
U.S. Cl. 219—84

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–22** is confirmed.

1. For use in electric resistance seam welding apparatus adapted to weld overlapped metal edges, an improved roller electrode having stator and rotor components, the stator and rotor components having annular surfaces spaced apart across thin gaps, bearing means for mounting said rotor to rotate relative to said stator with movement via said gaps, a conductive liquid simultaneously contacting said annular surfaces to electrically conduct a welding current across said gaps between the components, said rotor and stator being formed of different materials, said rotor being formed of a copper alloy having approximately 0.3–0.7% Beryllium (Be), 1.5–2.0% Nickel (Ni), with the balance Copper (Cu), thereby being durable under high temperatures and pressures, and electrically and thermally conductive; and said stator being formed of a copper alloy having approximately 1% Chromium (Cr) and the balance Copper (Cu), thereby having less durability under high temperatures and pressures, but having greater electrical and thermal conductivity than the rotor.



STATUTORY INVENTION REGISTRATIONS

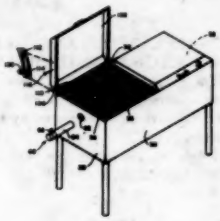
PUBLISHED SEPTEMBER 4, 1990

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H813
COMBINED SMOKER/COOKER UNIT

Robert E. Ragon, 4002 Spring Meadow La., Flower Mound, Tex. 75028

Filed Mar. 29, 1988, Ser. No. 174,682
Int. Cl.[5] A47J *27/122*
U.S. Cl. 99—467 **15 Claims**



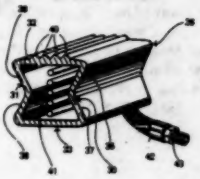
1. A combined smoker/cooker comprising:
a body having first and second ends, front and rear sides, a bottom and an open top which are associated with each other to form an open-topped container;
a partition means mounted within said open-topped container, said partition means being connected to said bottom, and to said sides and extending from said front side to said rear side to divide said open-topped container into a smoker compartment located adjacent to said first end and a fuel compartment located adjacent to said second end, with said compartments extending from said ends to said partition means and from said bottom to said open top, said partition means having a hole defined therethrough for defining a heat and mass transfer path between said smoker compartment and said fuel compartment, said hole being located to be positioned adjacent to said body bottom;
a fuel supporting grate mounted in said fuel compartment;
a food supporting grille mounted in said smoker compartment;
draft means on said body in said fuel compartment and comprising draft openings in the body second end, and means for adjusting the sizes of said draft openings;
flue means associated with said smoker compartment for removing smoke and heat from said smoker compartment and comprising a passage defined in said body first end;
a smoker compartment cover hingeably connected to said body rear side; and
a fuel compartment cover hingeably connected to said body rear side.

H814
COLLAPSABLE SEAL MEMBER

Dennis L. Sherrell, Kennewick, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,506
Int. Cl.[5] F16J *15/46*
U.S. Cl. 277—34.3 **2 Claims**

1. A seal number for providing pressure sealing between relatively movable members comprising: an annular body of resiliently yieldable elastomeric material formed in a unitary, one-piece construction and having a mounting wall secured to one of said members, a sealing wall in spaced and parallel relation to said mounting wall and a pair of radially spaced inner and outer circumferential side walls, said mounting and sealing walls formed integral with said side walls to define a hollow tubular structure in cross-sectional configuration, said side walls bent inwardly to influence the folding thereof into said tubular structure upon collapse of said tubular structure, said side walls being sufficiently rigid in the normal static state



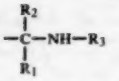
of said body for exerting forces against said sealing wall to urge said sealing wall in leaktight pressure sealing engagement against a seating surface on said other member, a plurality of integral annular ribs on said sealing wall and coextensive therewith for providing an interference fit with said seating surface, and means for evacuating the interior of said tubular structure to collapse said structure and displace said sealing wall away from said other member seating surface before laterally displacing said movable members relative to each other.

H815
LUBRICANT COMPOSITION CONTAINING A VISCOSITY INDEX IMPROVER HAVING DISPERSANT PROPERTIES

Carl L. Willis, 15922 Red Willow, Houston, Tex. 77084, and Andy M. Arismendi, Jr., 9707 Ravensworth, Houston, Tex. 77031

Filed Feb. 17, 1988, Ser. No. 157,355
Int. Cl.[5] C10M *155/02*
U.S. Cl. 252—49.6 **23 Claims**

1. A lubricant composition comprising:
(a) a major amount of a lubricating oil; and
(b) a minor effective viscosity improving amount of an oil soluble, functionalized selectively hydrogenated block copolymer to which has been grafted amine functional groups, said functionalized block copolymer comprising:
(1) a base block copolymer which comprises
(i) at least one polymer block A, said A block being at least predominantly a polymerized alkenyl arene block, and
(ii) at least one selectively hydrogenated polymer block B, said B block prior to hydrogenation being at least predominantly a polymerized conjugated diene block, and
(2) wherein substantially all of said amine functional groups are grafted to said base block copolymer on said A blocks, and
(3) wherein said amine functional groups are represented by the general formula



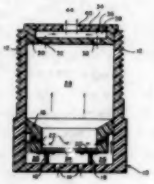
wherein R_1 and R_2 are the same or different alkyl, cycloaryl or aryl radicals and wherein R_3 is a hydrogen, alkyl, cycloalkyl, aryl or silyl radical.

H816

STIBINE FILTER AND ANTIMONIAL LEAD ACID BATTERIES

James H. Carder, Gaithersburg; Anh H. Le, Silver Spring, and Chester M. Dacres, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1986, Ser. No. 880,524
Int. Cl.[5] H01M *2/12*
U.S. Cl. 429—86 **4 Claims**



1. A process for removing stibine from the gases generated by antimonial lead-acid batteries comprising filtering the gases through activated charcoal which causes the stibine to decompose into antimony metal which is deposited on the charcoal and hydrogen gas which is carried away in the exiting gases.

H817

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Masaharu Toriuchi, and Keizo Koya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Apr. 29, 1988, Ser. No. 188,576
Claims priority, application Japan, Apr. 30, 1987, 62-104497
Int. Cl.[5] G03C *1/08, 7/26, 7/32*
U.S. Cl. 430—544 **7 Claims**

1. A photographic light-sensitive material comprising a support having provided thereon at least one silver halide emulsion layer, wherein said light-sensitive material contains

(1) a compound represented by formula (I)

PWR—Time—$_t$PUG

wherein PWR represents a group capable of releasing (Time—$_t$PUG upon being reduced; PUG represents a photographically useful group; Time represents a group capable of releasing PUG through a reaction subsequent to the release from FWR in the form of —Time—$_t$PUG; and t represents 0 or 1, and

(2) a polymer comprising at least 10 repeating units derived from the same monomer and having a molecular weight of 100 or more.

H818

ELASTOMERIC COMPOSITIONS (C-1911)

Joseph Wagensommer, Westfield; Pawan K. Agarwal, Bridgewater, and Ilan Duvdevani, Leonia, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 807,675, Dec. 11, 1985, abandoned. This application Apr. 3, 1987, Ser. No. 34,493
Int. Cl.[5] C08C *19/20; C08F 8/34*
U.S. Cl. 525—333.9 **2 Claims**

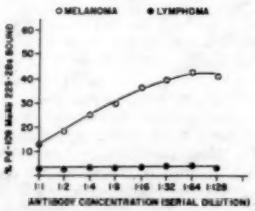
1. A sulfonated terpolymer of hexene-1 ethylene/ENB wherein the hexene-1 content of said terpolymer is about 70 to about 99 mole percent and the ethylene content of said terpolymer is about 2 to about 20 mole percent, said sulfonated terpolymer being formed by a solution sulfonation process of said hexene-2/ethylene/ENB.

H819

PALLADIUM-109 LABELED ANTI-MELANOMA MONOCLONAL ANTIBODIES

Suresh C. Srivastava, Setauket; Rashid A. Fawwaz, Pelham, and Soldano Ferrone, Scarsdale, all of N.Y., assignors to The United States of America as represented by the Secretary of Energy, Washington, D.C.

Filed Apr. 30, 1984, Ser. No. 605,439
Int. Cl.[5] A61K *43/00, 39/395*
U.S. Cl. 530—389 **4 Claims**



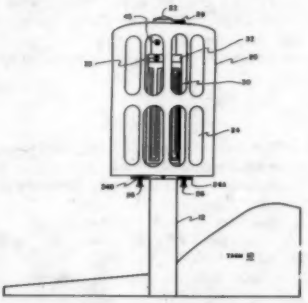
1. A radiopharmaceutical composition consisting of the monoclonal antibodies to human high molecular weight melanoma associated antigens, or fragments of said antibodies which are chelate-conjugated and labeled with palladium-109.

H820

INFRARED SAFETY BEACON

Wayne A. Smoot, 12871 Laurel Hills Dr., Woodbridge, Va. 22192

Filed Jun. 1, 1989, Ser. No. 359,601
Int. Cl.[5] G01J *1/00*
U.S. Cl. 250—504 R **7 Claims**



1. An infrared safety beacon mountable on a tank during live

fire training exercise for monitoring by an infrared viewer, said safety beacon comprised of:

infrared generating heater means mounted on the top outer cylindrical portion of a vertical hollow tube attached to a manned tank, said heater means having electrial leads leading through said hollow tube to an internal power supply in said tank;

rotatable thermal chopper means comprised of a cylindrical housing surrounding said heater means, said cylindrical housing having openings over about one half of the circumference; and

motor means for rotating said chopper means, said motor means supported within the upper portion of said hollow tube by a split collar spacr and a flange built around said motor means whose outside diameter is flush with the outside diameter of said hollow tube, said motor means having a power connection through said hollow tube to said tank internal power supply and a drive shaft extending out from said flange and rotatable about bearing mans in said flange, wherein said thermal chopper means is rotated around said heater means to provide intermittent flashes of infrared energy to said infrared viewer to identify said tank as a manned vehcile rather than a steady infrared emitting heated silouette target useed in live fire training exercises.

H821

MEANS AND METHOD FOR PERFORMING SHIELDING EFFECTIVENESS MEASUREMENTS USING MODE-STIRRED CHAMBERS

Michael O. Hatfield, Fredericksburg, and Lawrence C. Halley, Jr., Zacata, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

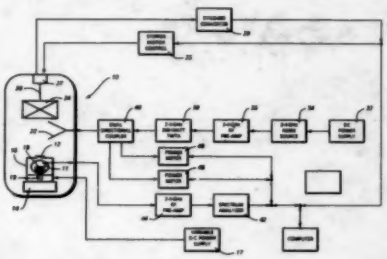
Filed Mar. 27, 1990, Ser. No. 499,747
Int. Cl.[5] G01R *27/00*
U.S. Cl. 324—627 **6 Claims**

1. A method of determining shielding data for a piece of equipment under test (EUT) using a mode-stirred chamber comprising the steps of:

a. transmitting radio frequency fields across a continuous spectrum of test frequencies from a radio frequency noise source into said chamber;

b. distributing said radio frequency fields uniformly within said chamber;

c. exposing said EUT to said uniformly distributed fields within said chamber; and



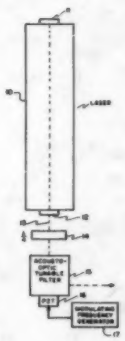
d. detecting the amplitude of said transmitted radio frequency fields leaking into said EUT.

H822

METHOD OF AMPLITUDE MODULATING A LASER BEAM

John E. Nettleton, 8106 Oak Hollow Ct., Fairfax Station, Va. 22039, and Dallas N. Barr, 11974 William and Mary Cir., Woodbridge, Va. 22192

Filed Apr. 28, 1989, Ser. No. 344,723
Int. Cl.[5] H01S *3/00*
U.S. Cl. 330—4.3 **1 Claim**



1. A method of amplitude modulating a laser beam, including the steps of:

directing said laser beam into a colinear acousto-optic tunable filter including an anisotropic medium with a piezoelectric transducer affixed thereto; and

applying an A.C. voltage to said transducer, whereby said laser is amplitude modulated to produce a modulation envelope in accordance with said A.C. voltage.

REISSUES

SEPTEMBER 4, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,319
DISPENSER FOR PASTY COMPOSITIONS

Horst Diener, Ulm-Gogglingen, Fed. Rep. of Germany, assignor to Vita Zahnfabrik H. Rauter GmbH & Co., Bad Sackingen, Fed. Rep. of Germany

Original No. 4,718,570, dated Jan. 12, 1988, Ser. No. 27,601, Mar. 18, 1987. Application for reissue Feb. 13, 1989, Ser. No. 309,298

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 8609228[U]

Int. Cl.[5] B65D *51/18*

U.S. Cl. 220—253 **28 Claims**

1. A dispenser for pasty compositions, especially facing material in dental technology and the like, comprising:

a circular box being closed by a cover and having a bottom and a wall, characterized in that in the peripheral area of the box cavity there is arranged a packing member (**11**), covering an opening (**32**) formed in the cover (**30**) when the cover (**30**) is in the closing position, and that the cover (**30**), being guided in an endless groove (**36**), can be turned on the box (**10**).

Re. 33,321
PROCESS FOR THE PRODUCTION OF A SUBSTRATE FOR AN ELECTRICALLY CONTROLLED DEVICE AND DISPLAY SCREEN PRODUCED FROM SUCH A SUBSTRATE

Jose Magarino, 9 rue Bagon Aripoli, 923350 Plessis Robinson; Nicholas Szydlo, 6, allee des Arpents, 91470 Limours; Michel Hareng, 17, Chemin De La Garenne, 91290 La Nourville, and Pierre Landouar, 92 Av. Du General Leclerc, 91120 Palaiseau, all of France

Original No. 4,643,527, dated Feb. 17, 1987, Ser. No. 642,527, Aug. 20, 1984. Application for reissue Feb. 16, 1989, Ser. No. 311,710

Claims priority, application France, Aug. 26, 1983, 83 13788

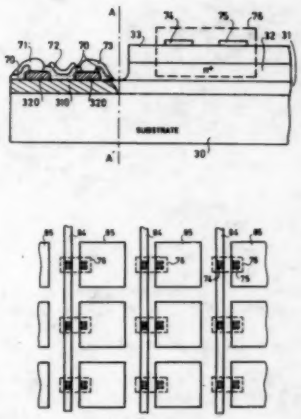
Int. Cl.[5] G02F *1/13*; H01L *21/205*

U.S. Cl. 350—333 **8 Claims**

6. A display screen of the matrix access type incorporating an electro-optical material layer inserted between a transparent layer and a silicon substrate comprising:

first active elements in a region of the silicon substrate consisting of amorphous silicon, said first active elements being in series with the image elements of the display screen, and

second active elements in a region of the silicon substrate that were initially amorphous but were transformed by annealing



to polycrystalline silicon, said second active elements being used to address the matrix access display screen.

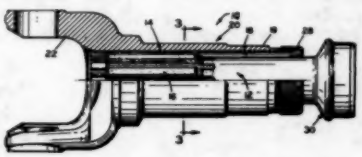
Re. 33,322
DRIVE LINE SLIP JOINT ASSEMBLY

David Sills, Pueblo, Colo., and John Beckman, Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Original No. 4,552,544, dated Nov. 12, 1985, Ser. No. 453,077, Dec. 27, 1982. Application for reissue Nov. 12, 1987, Ser. No. 119,759

Int. Cl.[5] F16C *3/03*; F16D *3/06*

U.S. Cl. 464—162 **6 Claims**



5. A drive line slip joint component having a plurality of axially extending splines, each spline comprising an axially extending face, each face having a circumferentially extending width, at least two of said faces each comprising one resilient protuberance, each of said faces further comprising a low-friction coating bonded thereto, each resilient protuberance comprising an integral portion of said coating, said coating generally having a constant thickness over said face, said thickness within the range of 0.007 to 0.014 inch, and said protuberance extending 0.001 to 0.003 inch above the surface of said coating, said protuberances being circumferentially spaced apart about said component, said protuberances providing means for enhancing the dynamic balancing of said component.

Re. 33,323

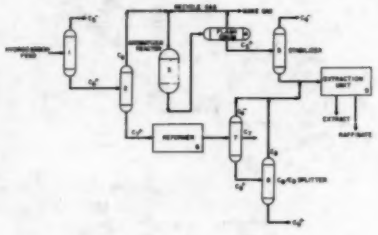
REFORMING PROCESS FOR ENHANCED BENZENE YIELD

John C. Roarty, Baton Rouge, La., and Murray Nadler, Houston, Tex., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Original No. 4,594,145, dated Jun. 10, 1986, Ser. No. 679,500, Dec. 7, 1984. Application for reissue Jun. 10, 1988, Ser. No. 204,754

Int. Cl.[5] **C10G** *37/06*

U.S. Cl. 208—79 **61 Claims**



20. A process for reforming a hydrocarbon feed comprising:

(a) separating said hydrocarbon feed into a lighter fraction, comprising at least one member selected from the group consisting of C_6, C_7, and C_8 hydrocarbons, and a heavier fraction;

(b) reforming said lighter fraction under reforming conditions in a reformer in the presence of a non-acidic catalyst, said non-acidic catalyst comprising a non-acidic zeolite support, to produce a first reformate;

(c) reforming said heavier fraction under reforming conditions in the presence of an acidic catalyst to produce a second reformate;

(d) introducing said first reformate into an extraction unit;

(e) separating and removing an aromatic extract stream and a non-aromatic raffinate stream from said extraction unit; and

(f) recycling said non-aromatic raffinate stream to said hydrocarbon feed for reforming under reforming conditions in the presence of a non-acidic catalyst to produce a stream comprising benzene.

Re. 33,324

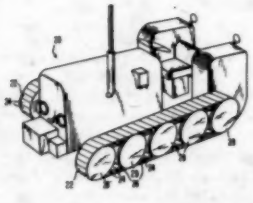
ENDLESS DRIVE SYSTEM

John W. Edwards, Brandon; Daniel R. Harper, and Quinton B. McNew, both of Ft. Myers, all of Fla., assignors to Edwards, Harper, McNew & Co., Fort Myers, Fla.

Original No. 4,569,561, dated Feb. 11, 1986, Ser. No. 607,067, May 4, 1984. Continuation-in-part of Ser. No. 516,831, Jul. 25, 1983, abandoned. Application for reissue May 13, 1987, Ser. No. 49,382

Int. Cl.[5] **B62D** *55/205*

U.S. Cl. 305—35 R **88 Claims**



1. An endless drive system comprising:

a plurality of endless drive sections each including a substantially closed shoe portion having first and second side edges, first and second substantially closed side walls extending from the first and second side edges of the shoe portion and sloping inwardly therefrom toward the center of the endless drive section, and a central surface joining the first and second side walls to define therewith and with the shoe portion a chamber open at its end faces; and

a like plurality of cable connector sections, each including at least one cable member and means to attach one end of the cable connector section to the shoe portion of a first one of the endless drive sections and the other end of the cable connector section to the shoe portion of a second one of the endless drive sections, such attachments being within the chambers of the endless drive sections, to cause the plurality of cable connector sections to join the plurality of endless drive sections in a closed loop as an endless drive system.

Re. 33,325

REMOTELY CONTROLLABLE CIRCUIT BREAKER

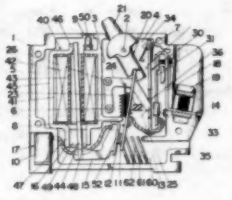
Yoichi Yokoyama, Itami, and Hideya Kondo, Yahata, both of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Original No. 4,604,596, dated Aug. 5, 1986, Ser. No. 772,912, Sep. 5, 1985. Application for reissue Apr. 7, 1987, Ser. No. 35,485

Claims priority, application Japan, Feb. 1, 1985, 60-18942; Jul. 12, 1985, 60-154455; Jul. 24, 1985, 60-163634

Int. Cl.[5] **H01H** *75/00*

U.S. Cl. 335—14 **10 Claims**



[1. A remotely controllable circuit breaker comprising in combination:

a single set of first and second contacts;

a manually operable switching mechanism for opening and closing the contacts, said manual switching mechanism including a manual handle movable between an ON position and OFF position and including a movable arm carrying the first contact which arm is operatively connected to the manual handle to be actuated thereby between an ON condition and an OFF condition for bringing the first contact into and out of contacting engagement with the second contact;

a trip mechanism operatively connected to the manually operable switching mechanism so as to open the contacts upon the occurrence of predetermined fault current conditions flowing through the breaker;

a remotely controllable switching mechanism for forcibly opening and closing the contacts in response to a remote control signal;

said second contact being movable between an operative position where it is in electrical contacting engagement with the first contact of the movable arm in the ON condition and an inoperative position where it is away from the first contact independently of the conditions of the movable contact arm; and

said second contact being operatively connected to said remotely controllable switching mechanism in such a way as to be moved from between the operative and the inoperative positions by the latter receiving the remote control signal.]

PLANT PATENTS

GRANTED SEPTEMBER 4, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,312

ROSE PLANT DICMADDER

Patrick Dickson, Newtownards, Northern Ireland, assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 6, 1989, Ser. No. 319,649
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant of the Shrub class substantially as herein shown and described, characterized particularly as to novelty by vigorous, hardy plant growth, disease resistant, dark green glossy foliage, upright, well branched habit of growth, and abundant bright orange flowers.

7,313

ROSE PLANT—MEIGRELOU VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 19, 1989, Ser. No. 354,285
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—24 **1 Claim**

1. A new and distinct variety of Floribunda rose plant characterized by the following combination of characteristics:

(a) abundantly forms attractive long lasting semi-double blossoms which are aureolin in coloration,
(b) forms bronze green adult wood,
(c) exhibits an erect growth habit,
(d) is well adapted for growing in a greenhouse for cut flower production, and
(e) exhibits excellent disease resistance;

substantially as herein shown and described.

7,314

DARLENE

William G. Ison, Rte. 1, Box 19, Hwy. 19, Brooks, Ga. 30205

Filed Mar. 10, 1988, Ser. No. 166,252
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—47 **1 Claim**

1. The new and distinct variety of grape plant, as described and illustrated.

7,315

CHRYSANTHEMUM PLANT NAMED LEONA

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed May 31, 1989, Ser. No. 359,922
Int. Cl.[5] A01H *5/00*
U.S. Cl. -0t.—74 **1 Claim**

1. A new and distinct plant of Chrysanthemum named Leona, as described and illustrated.

7,316

POINSETTIA PLANT NAMED YULETIDE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed May 22, 1989, Ser. No. 355,183
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct cultivar of Poinsettia plant named Yuletide, as illustrated and described.

7,317

DIEFFENBACHIA PLANT NAMED GOLDEN SUNSET

Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Sebring, Fla.

Filed May 18, 1989, Ser. No. 353,706
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of Dieffenbachia plant named Golden Sunset, as illustrated and described.

7,318

GERBERA PLANT NAMED 'DIVA'

Th A. Segers, Hoofddorp, Netherlands, assignor to Twyford Plant Laboratories, Inc., Santa Paula, Calif.

Filed Feb. 28, 1989, Ser. No. 316,909
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new distinct variety of Gerbera plant herein described and illustrated and identified by the characteristics enumerated above.

PATENTS

GRANTED SEP. 4, 1990

ERRATA

For CLASS	See PATENT NO.
038-036	4,953,300
030-392	4,953,301
033-265	4,953,302
033-284	4,953,303
033-355	4,953,304
033-356	4,953,305
033-503	4,953,306
033-600	4,953,307
053-556	4,953,336
070-366	4,953,420
102-229	4,953,475
102-289	4,953,476
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116-028	4,953,493
124-024	4,953,521
125-011	4,953,522
125-014	4,953,523
285-023	4,953,580
165-008	4,953,627
165-010	4,953,628
165-010	4,953,629
165-017	4,953,630
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165-104	4,953,632
165-109	4,953,633
165-147	4,953,634
166-303	4,953,635
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180-226	4,953,656
215-001	4,953,725
224-310	4,953,757
248-065	4,953,801
226-196	4,953,807
297-195	4,953,911
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354-320	4,954,838
354-075	4,954,857
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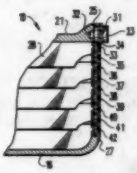
354-173	4,954,859
354-246	4,954,860
354-403	4,954,861
355-001	4,954,862
355-051	4,954,863
358-296	4,954,910
358-323	4,954,911
358-448	4,954,912
358-474	4,954,913
358-475	4,954,914
361-098	4,954,917
367-154	4,955,012
362-125	4,955,044

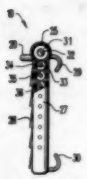
PATENTS

GRANTED SEPTEMBER 4, 1990

GENERAL AND MECHANICAL

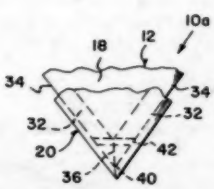
4,953,231
SHADE ATTACHMENT FOR EYEGLASSES
David W. Burnett, Rte. 1 Box 245E, Luther, Okla. 73054
Filed Jul. 19, 1989, Ser. No. 381,852
Int. Cl.[5] G02C *7/16, 1/00*
U.S. Cl. 2—13 **2 Claims**





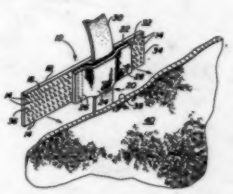
1. A shade attachment for eyeglasses, comprising:
a frame;
a pair of openings defined by said frame, said openings dimensioned for registry with lenses of a pair of eyeglasses;
a plurality of resilient clips on top and bottom portions of said frame, said clips configured for frictional engagement with top and bottom edges of eyeglass lenses;
two sets of slats, each set of slats including a plurality of slats extending across one of said openings;
an axle shaft extending from opposite ends of each of said slats and journalled for rotation in said frame;
a driven gear secured at one end of each of said slats on said axle shafts, for rotation therewith;
said driven gears extending in a collinear drive train;
an idler gear mounted for rotation on said frame between and in direct meshing engagement with each adjacent pair of said driven gears;
a drive gear mounted for rotation on said frame and in mesh with one of said driven gears;
all of said gears disposed in a collinear drive train; and
control means for manually rotating said drive gear.

4,953,232
COLLAR PROTECTOR
Lee R. Gaines, 410 A Rico St., Salinas, Calif. 93907, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007
Filed Jun. 5, 1989, Ser. No. 361,642
Int. Cl.[5] A41B *3/00*
U.S. Cl. 2—60 **2 Claims**



1. A disposable protector for a collar of a shirt, the collar having a neck band and outside flap with usual angular spaced corners, said protector comprising:
(a) a piece of thin moisture absorbent fabric material having a first portion approximately the size and shape of the neck band of the collar and a second portion sized to cover said outside flap and corners with a fold line between said portions;
(b) a plurality of pressure sensitive adhesive spots carried on one side of said piece of fabric material; and
(c) a removable backing sheet to cover said pressure sensitive adhesive spots and adapted to be removed so that said first portion of said piece of fabric material can be removably attached to inner surface of the neck band, folded over on the fold line and said second portion of said piece of fabric material can be removably attached to outer surface of the outside flap to absorb salt and moisture from the wearer of the shirt to prevent soiling of the neck band and outside flap of the collar, wherein said second portion of said piece of fabric material further includes a plurality of extended edge segments so that said extended edge segments can be folded over the edges of the outside flap of said collar and corners to be removably attached to inner surface of said outside flap and corner by said pressure sensitive adhesive spots; said extended segments having opposing forward ends adapted to abut each other when folded over said corners.

4,953,233
BRASSIERE STRAP RETAINER
David R. Moshier, 18620 Hatteras, #275, Tarzana, Calif. 91356
Continuation-in-part of Ser. No. 232,055, Aug. 15, 1988. This application May 30, 1989, Ser. No. 357,839
Int. Cl.[5] A41F *15/02*
U.S. Cl. 2—268 **10 Claims**



1. An improved brassiere strap retainer, said retainer comprising, in combination:
(a) a first flexible strip of hook and pad fastener material bearing hooks on one side thereof;
(b) a second flexible strip having a pad of hook-receiving hook and pad fastener material on one side thereof, facing said first flexible strip, one end of said second flexible strip being fixedly secured to said first flexible strip to expose a portion of said first flexible strip, said second flexible strip including a strap-receiving portion releasably secureable to said first flexible strip so as to releasably trap a brassiere strap between said strips, said exposed portion of said first flexible strip being adapted to releasably hook to a inner surface of a female garment covering said brassiere, so as to control the location of the garment in order to conceal the brassiere strap, and
(c) wherein said second flexible strip is fixedly secured to said first flexible strip so as to expose both opposite ends of said first flexible strip.

4,953,234

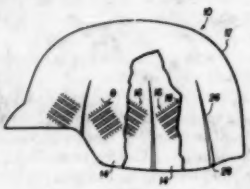
IMPACT RESISTANT HELMET

H. L. Li, Parsippany, and D. C. Prevorsek, Morris Township, Morris County, both of N.J., assignors to Allied-Signal Inc., Morris Townshihp, Morris County, N.J.

Continuation of Ser. No. 7,081,075, Aug. 3, 1987, abandoned. This application Jul. 10, 1989, Ser. No. 377,807

Int. Cl.[5] **B32B** *5/00*

U.S. Cl. 2—412 **18 Claims**



1. A helmet comprising an impact resistant composite shell comprising a plurality of prepreg packets where each prepreg packet comprises at least 2 prepreg layers, with each prepreg layer comprising a plurality of undirectional coplanar fibers embedded in a ploymeric matrix, the fibers of adjacent layers in the prepreg packets being at an angle of about 45° to 90° from each other, wherein the angle of fibers of adjacent layers in at least two different prepreg packets is different.

4,953,235

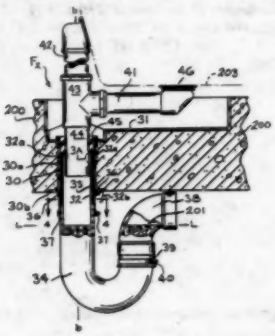
TRAP FITTING ASSEMBLY

Kenneth R. Cornwall, 4963 Springfield Dr., Dunwoody, Ga. 30338

Filed Jun. 10, 1988, Ser. No. 205,360

Int. Cl.[5] **E03C** *1/284*

U.S. Cl. 4—191 **18 Claims**



1. An improved trap fitting assembly which prevents the spread of fire and smoke through a floor of a building through the fitting assembly which comprises:

(a) a flammable tubuler coupling means having opposed ends which provides an opening along a longitudinal axis through the floor with an outside wall secured to the floor and an inside wall which defines the opening;

(b) a non-flammable, thin sleeve means with openings at opposed ends mounted on the inside of the coupling means along the axis between an upper and a lower plane of the floor and with an extension below the lower plane of the floor with a thickness between inner and outer walls of the sleeve means less than the thickness between the walls of the coupling means, wherein the sleeve means has an enlarged ring above an elongate cylindrical portion on an outside wall around the longitudinal axis of the coupling means and wherein a thin flammable spacer tube means is mounted on the inside wall of the coupling means and on the elongate cylindrical portion of the sleeve means to hold the sleeve means in the coupling means by engagement with the enlarged ring; and

(c) a non-flammable J-pipe means removable secured to the extension at a lower most of the openings of the sleeve means by a connection means, wherein in use the J-pipe means is filled with water in a lower portion of the J-pipe means thereby preventing smoke and fire from below the floor from moving up through the coupling means and sleeve means to above the floor.

4,953,236

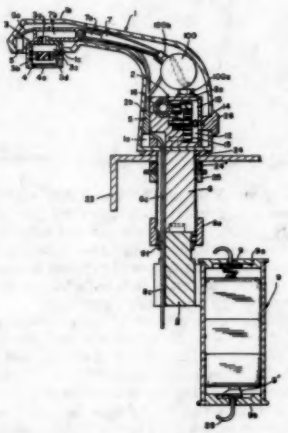
AUTOMATIC MIXING FAUCET

Chang H. Lee, 300 Winston Dr., Apt. 810, Cliffside Park, N.J. 07010, and Young J. Kim, 103-4, Ko chuch-Dunk, Ku-Koku, Seoul, Rep. of Korea

Continuation of Ser. No. 244,135, Sep. 14, 1988, Pat. No. 4,886,207. This application Jun. 1, 1989, Ser. No. 359,994

Int. Cl.[5] **E03C** *1/04*

U.S. Cl. 4—194 **3 Claims**



1. A compact automatic water tap including a hollow tap body defining the outer shell of the tap adapted to be located above the surface on which the tap is to be mounted, said tap body having a base adapted to be placed on the surface on which the tap is to be mounted and a water discharge end portion, said tap containing within said shell, between said base and said discharge end portion a hot and cold water mixing valve, sensing means for sensing the presence or absence of an object beneath said water discharge end portion; and an automatic water supply valve means in said shell connected to said mixing valve and being operative in response to said sensing means to control water flow from the tap, and check valve means also located within said shell and connected to the water supply valve for preventing water flow from the water supply when the water supply valve is off.

4,953,237

TWO STAGE FLAPPER VALVE FOR FLUID RESERVOIRS

Bernard C. Perkins, 920 Avenue "T" SE., Winter Haven, Fla. 33880

Filed Mar. 1, 1990, Ser. No. 485,946

Int. Cl.[5] **E03D** *9/02*

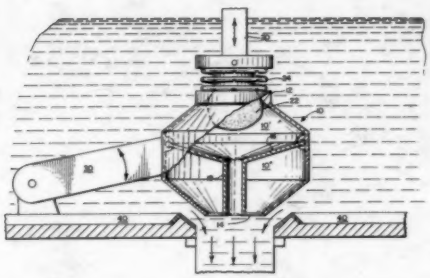
U.S. Cl. 4—324 **2 Claims**

1. In combination with a fluid reservoir, defining a valve seat

at its bottom and bearing an operating crank lever which is pivoted to a wall of the reservoir;

(a) a normally submerged globular flapper valve, movably engaging the reservoir in hermetically sealed relation to the reservoir valve seat, said flapper valve having open ends at top and bottom and interconnected top and bottom chambers, wherein the topmost chamber defines a drain extending centrally through the bottom chamber, the drain being coterminous at its end to the open end of the bottom chamber of said flapper valve;

(b) a normally submerged secondary spring-loaded plunger valve, compressibly mounted upon the flapper valve and having engagement with said crank lever, said plunger valve being adapted to engage the open top of the flapper



valve in hydraulically sealable superposition relative to the top chamber of said flapper valve;

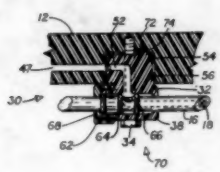
(c) said operating crank lever operably engaged with the secondary spring-loaded plunger valve by a substantially rigid connector, said crank lever being operable from an intermediate position of repose "R", to a depression position whereby said flapper valve is moved from said valve seat for a full flush "F" and to a combination lift position "H" + "F", wherein said plunger valve is moved from said open top end to relieve air from the top chamber to be replaced with water via said drain thereby reducing the buoyancy of said flapper valve, and sequential depression of the crank lever to position "F", and upon immediate release of the crank lever from position "F", a half flush of the fluid reservoir is effected.

4,953,238

SANITIZING SPRAY SEAT FOR TOILET

John P. Shifferly, 5729 Estancia Dr., Apt. No. 2232, Orlando, Fla. 32822

Filed Apr. 24, 1989, Ser. No. 342,529
Int. Cl.[5] E03D 9/08
U.S. Cl. 4—420.2 **11 Claims**



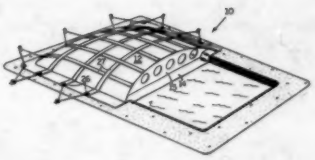
5. A sanitizing spray device for use on a toilet having a seat member, comprising an elongate, generally tubular member having a spray means adjacent one end, means for supplying water at a selected temperature and quantity to said generally tubular member, so that water can be caused to travel for a portion of the length of the tubular member, and then issue as a spray of water from said spray means, mounting means adapted to be located under the seat member for pivotally mounting said generally tubular member at a location intermediate its ends, said mounting means being constructed to permit said generally tubular member to be swung from a recessed position in which it principally resides under the confines of the seat member, to a deployed position in which said spray means is in approximately a central location with respect to the principal aperture of the seat member and the bowl of the toilet, whereby a user sitting on the toilet seat can cause a sanitizing spray of water of selected temperature to be directed upwardly at the private parts of the user, said means for supplying water being connected to said mounting means, latter means serving to distribute water directly to said tubular member, said mounting means having valve means therein to control the flow of water into said generally tubular member and then to pass outwardly through said spray means, which valve means is sensitive to the longitudinal position in which said generally tubular member resides in said mounting means, said valve means being operative to control such flow of water by the user grasping a portion of said generally tubular member, and then pushing it or pulling it with respect to said mounting means in a direction coinciding with the direction of its longitudinal axis.

4,953,239

INFLATABLE POOL COVER

Harold S. Gadsby, 13069 IH 35 North, San Antonio, Tex. 78233

Filed Aug. 24, 1988, Ser. No. 216,151
Int. Cl.[5] E04H 3/19
U.S. Cl. 4—499 **1 Claim**



1. An inflatable swimming pool cover comprising:

an upper layer having a first perimeter and a lower layer having a second perimeter, said upper and lower layers being made of a material substantially impermeable to air and water, said lower layer having dimensions whereby said lower layer, if laid on the surface of the pool water at a normal level would form a flat shape over said pool water whereon said cover is to be installed, and said record perimeter would extend outwardly beyond said swimming pool's outer boundary, said upper layer having dimensions whereby said upper layer, if inflated, in combination with said lower layer over a swimming pool water surface whereon said cover is to be installed would form a dome shape with relatively steep sides that direct rain water, leaves and other debris off of said cover entirely and over the edge of the pool boundary, said first perimeter would extend outwardly beyond said swimming pool's outer boundary and said first and second perimeters would be coincident;

said upper layer having a hole formed therethrough, said hole being small relative to the size of said upper layer;

said first and second perimeters are sealingly attached one to the other whereby a substantially air-tight interior space is defined between said upper layer forming said dome shape and said lower layer forming said flat shape except as prevented by said hole;

said cover having an air conduit sealingly attached to said upper layer over said hole whereby said air conduit provides the sole avenue of fluid communication between said interior space and space exterior to said cover through an air conduit opening at the terminal end of said air conduit;

blower means for providing a continuous effluence of air for inflating and maintaining the inflation of said interior space with said air, said blower means having an output orifice wherefrom said air exits said blower means;

a blower mating member for lockingly mating with said output orifice of said blower means for receiving substantially all of said blower means' continuous effluence of air, said blower mating member being sized whereby said blower mating member tightly fits within said air conduit at said air conduit opening, said blower mating member being sealingly joined with said air conduit with adhesive means;

a plurality of lengths of synthetic webbing, each of said lengths extending across said upper layer forming said dome shape beginning at a first respective said grommet on a first side or end of said cover and terminating at a second respective said grommet on a second side or end of said cover, said lengths being attached to said upper layer by said respective grommets' passing through said lengths prior to passing through said upper and lower layers, said plurality of lengths being placed in a woven arrangement overlying said upper layer forming said dome shape and being sewn together at said lengths respective intersections, said plurality of lengths providing a safety net for supporting individuals who come to rest on said cover when installed on said pool; and

one or more retaining members situated between and attached to said upper and lower layers, wherein said retaining members are sheets of material cut to approximate the desired cross sectional shape of said cover when inflated, each said retaining member being formed whereby air may move therethrough throughout the interior space of said cover to permit uniform inflation thereof.

4,953,240

HYDROTHERAPY MASSAGE UNIT

John Gardenier, Guilderland, N.Y., assignor to Saratoga Spa & Bath Company, Latham, N.Y.

Continuation of Ser. No. 110,688, Oct. 20, 1987, Pat. No. 4,860,392. This application Jun. 12, 1989, Ser. No. 364,603

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] **A61H** *33/02*

U.S. Cl. 4—542 **5 Claims**

1. In a hydrotherapy tub having a seat backrest surface, a headrest surface immediately above the top of said seat backrest surface, and water recirculating means, the cimbination of coplanar ejector means comprising a directional water ejector which is comprised of a base disposed on a flat tub surface portion, water chamber means disposed over said base for confining water therein, said water chamber means having at least one lateral port therein with the exit plane of said port parallel to said base and disposed coplanar with said tub surface, and conduit means for conducting water from said recirculation means into said ejector so that the water is expelled therefrom through said port parallel to and coplanar with said base, said directional water ejector secured to a tub above said tub's normal fill level and near the upper end of said seat backrest surface immediately below the headrest surface so as to be disposed in stand-apart registry with the nape of a user's neck, when said user is seated against said backrest, said ejector postioned to deliver and direct a strong, rapid stream of water in coplanar flow from proximate said headrest surface down said seat backrest surface, said stream entraining air into said

flow to effect a turbulent stream as the water-air mixture moves down said backrest.

4,953,241

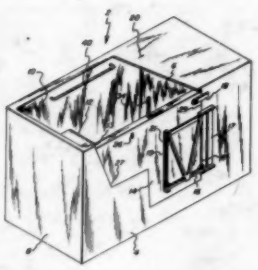
BATHTUB WITH DOOR FOR EASY ACCESS

Douglas P. Williams, 4 Dussault Drive, Latham, N.Y. 12110

Filed Dec. 30, 1988, Ser. No. 292,395

Int. Cl.[5] **A47K** *3/02*

U.S. Cl. 4—556 **15 Claims**



1. A bathtub easily and safely accessible from a sitting position comprising:

an upwardly opening enclosure having a substantially horizontal floor and having walls rising upwardly from the floor, including an entrance wall and a forward wall transversely adjoining same;

a seat member having a seating surface with a forward edge and an entrance edge, said seat being mounted substantially horizontally within said enclosure above the level of the floor with its forward edge spaced apart from the forward wall so as to define a leg space therebetween and having its entrance edge adjacent the entrance wall;

said entrance wall defining an entrance opening having a door mounted therein, said door having a forward edge on its one end adjacent the adjoinment of said wall with the forward wall and a rearward edge on its other end, said door being operable between a closed position in which it forms a watertight seal with said entrance opening and an opened position in which it is substantially parallel to the forward wall and closely adjacent thereto, said door being configured to fit said opening and said opening being defined by a jamb running, at least in part, along the entrance edge of the seat and along the floor so as to provide said opening into the space over the seat and into the leg space; and

means defining the movement of the door so that, in operating from its closed to its opened position, its forward edge moves directly inwardly along the front wall while its rearwardly edge moves forwardly without any substantial inward movement,

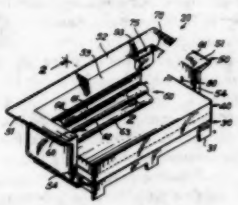
whereby said door can be operated between its opened and closed positions while an occupant is seated on the seat member adjacent its entrance edge.

4,953,242

PADDED FLARE-BACK SOFA

Anne Harris, New York, N.Y., assignor to Anne Harris, New York, N.Y.

Filed Mar. 9, 1989, Ser. No. 321,502
Int. Cl.[5] A47C 17/13, 17/32
U.S. Cl. 5—18.1 **15 Claims**



1. An article of furniture including two sides and a back, which is convertible between a sitting unit when closed and a sleeping unit when open, comprising:

a top housing wherein both of the sides and the back flare out horizontally at the top, creating a ledge;

a storage compartment formed within the housing when in the closed position;

a padded back cushion member forming a first side of the storage compartment when in the closed position and forming a vertical head rest when in the open position;

a top platform contiguous to the flared sides and back which extends the flat surface of the ledge thereby formed, which platform forms a second side of the storage compartment when in the closed position;

a wall member within the housing forming a chamber for storage of the top platform when in the open position;

a double mattress forming a sitting surface in the closed position, which mattress unfolds to form a sleeping surface in the open position; and

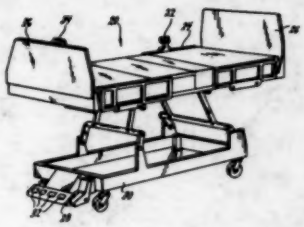
a bottom member, inserted within a sleeve of the top housing when in the closed position, which member slidably protrudes to support in part the mattress in the open position.

4,953,243

ELECTRONIC CONTROL WITH EMERGENCY CPR FEATURE FOR ADJUSTABLE BED

Kenneth R. Birkmann, St. Peters, Mo., assignor to Amedco Health Care, Inc., Wright City, Mo.

Filed Aug. 9, 1989, Ser. No. 391,886
Int. Cl.[5] A61G 7/06
U.S. Cl. 5—60 **13 Claims**



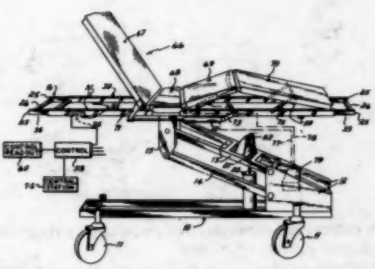
1. In an adjustable bed having means for repositioning a plurality of portions of said bed with respect to each other, the improvement comprising a control having means for permitting an operator to input a coded command to initiate the automatic repositioning of said plurality of portions so as to bring said bed into a pre-determined position on an emergency basis, said control means having a logic means responsive to the coded operator command in order to prevent inadvertent operation.

4,953,244

HOSPITAL BED FOR WEIGHING PATIENTS

Clement J. Koerber, Sr., Batesville, and Howard J. Boyd, Oldenburg, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Dec. 28, 1987, Ser. No. 138,829
Int. Cl.[5] A61G 7/00, 19/59
U.S. Cl. 5—60 **6 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 37 Pages)



1. A hospital bed comprising:

a base,

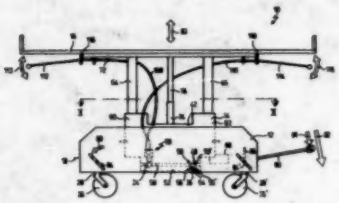
a rectangular support frame mounted on said base, said support frame being rectangular in cross section,

a rectangular weigh frame overlying said support frame, said weigh frame being formed of spaced parallel frame elements of an inverted U-shape in cross section,

said support frame being nested within said inverted U-shaped weight frame elements,

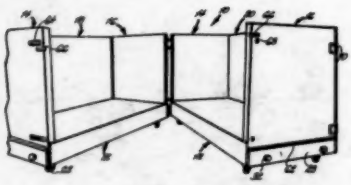
a load cell at each of the four corner portions of said weigh frame connecting said weigh frame to said support frame.

4,953,245
DEVICE FOR MOVING PATIENTS WHO ARE CONFINED TO BED
Hans Jung, Dammstrasse 9, D-7052, Schwaikheim, Fed. Rep. of Germany
Filed Dec. 5, 1989, Ser. No. 446,079
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902027
Int. Cl.[5] A61G 1/02, 7/06
U.S. Cl. 5—81 B 12 Claims



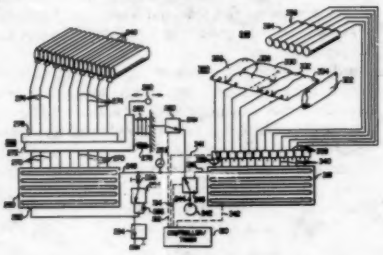
1. Device for moving patients who are confined to bed, comprising a travelling undercarriage which can be locked in place by means of a locking brake, a stretcher support which can be adjusted vertically and laterally relative to the undercarriage, and a locking gear for the stretcher support, wherein a solid block carrying the said vertically adjustable stretcher support is carried itself by at least one guide element extending transversely of the said undercarriage in such a manner that the block can be displaced in a transverse direction between two lateral end positions, and that the said locking gear comprises stop means attached to the said block, said stop means can be controlled from the said stretcher support and engage recesses provided on the said guide element for blocking the relative movement of the said block.

4,953,246
CUBICLE BED
O. H. Matthews, 230 Okemah Trail, SE., Marietta, Ga. 30060
Filed Apr. 2, 1990, Ser. No. 503,628
Int. Cl.[5] A61G 7/06
U.S. Cl. 5—424 11 Claims



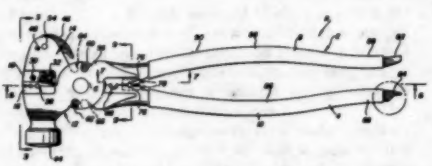
1. A cubicle bed for protectively confining a traumatically brain injured patient comprising:
a horizontal rectangular base having two connectable generally equally sized rectangular base portions with generally coplaner padded upper surfaces;
an upright removable end panel having a padded interior surface connected to, and upwardly extending from, each of the ends of said base portions;
two said end panels connectably positionable in side-by-side relationship at each end of each said base;
a removable upright side door having a padded interior surface pivotally connectable along a mating upright margin of each said end panel at each corner of said base;
two said upright side doors forming a side panel along each side of said base when closed;
said end panels and said side doors, when closed, forming a padded upright enclosure extending upwardly to form a generally horizontal upper perimeter for confining the patient therewithin atop said base;
said upper perimeter positioned sufficiently high above said base to restrict viewing of normal activity and surroundings adjacent said cubicle bed by the patient.

4,953,247
AIR-OPERATED BODY SUPPORT DEVICE
Charles E. Hasty, Box 185, Carrollton, Tex. 75006
Continuation-in-part of Ser. No. 192,583, May 9, 1988. This application Apr. 13, 1989, Ser. No. 335,945
Int. Cl.[5] A61G 7/057
U.S. Cl. 5—453 6 Claims



1. An air-operated support apparatus for a patient comprising:
(a) a plurality of adjacent air sacks formed of a material substantially impervious to the passage of fluids, each sack having an inlet tube;
(b) an air flow source for producing a stream of forced air;
(c) a pressure selector communicating with the sacks and the air flow source for selectively maintaining a desired profile of air pressure among the sacks;
(d) a single valve between the pressure selector and the air sack inlets movable between at least two states: a first state in which the sack inlets are open to fluid communication from the air flow source through the pressure selector; and a second state in which the sack inlets are closed, whereby the pressure profile among the sacks established by the air flow source and pressure selector when the valve is in the first state may be substantially preserved upon movement to the second state.

4,953,248
ELECTRICIAN'S COMPOUND TOOL
Thomas L. Trombetta, 3943 Roselle Ave., Modesto, Calif. 95355
Filed Feb. 2, 1990, Ser. No. 473,827
Int. Cl.[5] B25F 1/00
U.S. Cl. 7—107 25 Claims



1. A hand tool, comprising:
(a) first and second members;
(b) means for pivotally connecting said first member to said second member;
(c) said first and second members including first and second handle portions, respectively, on one side of said connect-

ing means and first and second jaw portions, respectively, on the other side of said connecting means;

(d) said first and second jaw portions being positionable between closed and open positions when said handle portions are brought together or spread apart, respectively;

(e) first and second cooperating cutter blades disposed on said first and second jaw portions, respectively, for cutting when said first and second jaw portions are closed;

(f) said first and second cutter blades including first and second straight cutting edge portions, respectively, and at least first and second arcuate edge portions, respectively;

(g) said at least first and second arcuate edge portions forming at least a circular cutter when said first and second jaw portions are closed;

(h) one of said first and second jaw portions including an outward transverse extension terminating in a hammer head extending laterally outwardly of said handle portions when brought together; and

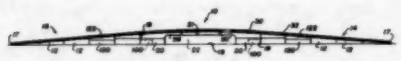
(i) the other of said first and second jaw portions including an outward transverse extension terminating in a pivotable knife blade having a first protected position and a second exposed position.

4,953,249

MODULAR OVERPASS OR RAISED PARKING STRUCTURE

Jack A. Warwick, #103-1515 Chesterfield Avenue, North Vancouver, British Columbia, Canada V7M 2N5

Filed Sep. 11, 1989, Ser. No. 405,199
Int. Cl.[5] E01D *15/00*
U.S. Cl. 14—2.4 **24 Claims**



1. A modular overpass for vehicular traffic comprising:

interlockable roadway units including ramp units adapted for fitting together to create entry and exit ramps, each ramp having a low end and a raised end; cantilever units for attachment to said raised ends of said ramps, and suspended span units for joining said cantilever units;

flexible footings to support said roadway units, said footings comprising a resilient base, a covering cap sealably fitted over said base to define a cavity, and a packable bearing material partially filling said cavity; and

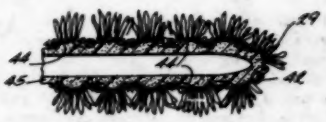
anchoring means to maintain said roadway units in position.

4,953,250

DISPOSABLE WASH MITT WITH DETERGENT

Steven R. Brown, 2003 Granger Rd., Manitowoc, Wis. 54220

Filed Aug. 3, 1989, Ser. No. 389,536
Int. Cl.[5] B08B *1/00*; B32B *3/02*
U.S. Cl. 15—104.94 **8 Claims**



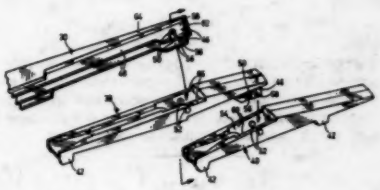
1. A disposable, nonwoven, high-pile wash-mitt with timed release of the detergent, including a first-body portion and a second-body portion secured together to form the mitt, at least one of said body-portions including a nonwoven web having a high-pile exterior surface and a plurality of pores formed in an interior surface of said mitt wherein individual pores of said plurality of pores are disposed opposite corresponding individual portions of said high pile surface, said pores being filled and said interior surface being coated with a water-soluble detergent.

4,953,251

WIPER JOINT STRUCTURE

Simon S. M. Chow, Toronto, Canada, assignor to Tridon Limited, Oakville, Canada

Filed Jan. 28, 1987, Ser. No. 7,547
Int. Cl.[5] B60S *1/32*
U.S. Cl. 15—250.32 **10 Claims**



1. In an articulated windshield wiper including a plurality of longitudinally extending yokes pivotally connected to each other to form an elongate holder for supporting a wiper blade, and movable with a wiper arm driven to reciprocate the blade over a windshield in use, at least one pivotal connection being provided for pivotally connecting said yokes, the pivotal connection comprising:

a resilient outwardly biased inner portion provided on one of said yokes and comprising a pair of spaced parallel flanges;

a rigid outer portion provided on another of said yokes and adapted to receive the inner portion; and

hinge means adapted to connect the outer and inner portions comprising a pair of inwardly directed pivot stubs located opposite one another and fixed to inner surfaces of the outer portion, and a corresponding pair of apertures provided on respective flanges of said inner portion, said apertures being adapted to receive the stubs, the inner and outer portions being dimensioned for an interference fit such that insertion of the inner portion into the outer portion biases the flanges towards one another until the pivot stubs snap into engagement with the apertures thereby allowing the flanges to return towards a spaced orientation in which outer surfaces of the flanges are urged into abutment with the inner surfaces of the outer portion such that relative lateral movement between the yokes is minimized to reduce rattling of the wiper upon said reciprocal movement and sufficient pivotal movement at the hinge means is allowed for the articulated wiper to conform to the surface of a curved windshield.

4,953,252

ROLL SURFACE CLEANING DEVICE

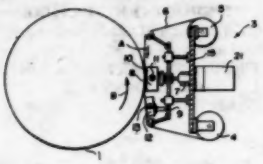
Taiji Akisawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1989, Ser. No. 410,445
Claims priority, application Japan, Sep. 22, 1988, 63-237979
Int. Cl.[5] D21G *9/00*
U.S. Cl. 15—308 **1 Claim**

1. A roll surface cleaning device for cleaning the surface of a roll used in a supercalender, a laminator, a film forming machine or the like comprising,

a cleaning material strip which is softer than the roll surface and is in a continuous length, a feedout means which feeds out the cleaning material strip, a takeup means which takes up the cleaning material strip, a pressing means

which presses the cleaning material strip against the roll surface between the feed-out means and the takeup means, a vibration generating means which imparts fine vibration to the pressing means, a first suction means which applies suction force to the cleaning material strip from behind at



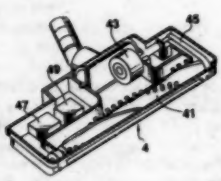
the portion which is pressed against the roll surface and a second suction means which is provided between the first suction means and the takeup means and applies suction force to the cleaning material from the side opposite to the side which is pressed against the roll surface.

4,953,253

CANISTER VACUUM CLEANER WITH AUTOMATIC OPERATION CONTROL

Norisuke Fukuda, Tokyo, and Yuji Shimada, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 199,338, May 26, 1988, abandoned. This application Jun. 29, 1989, Ser. No. 373,068
Claims priority, application Japan, May 30, 1987, 62-137198
Int. Cl.[5] A47L *9/28*
U.S. Cl. 15—319 **4 Claims**



1. A canister vacuum cleaner, comprising:
a canister including means for providing suction power; and
a power nozzle for cleaning floor by using the suction power including:
a rotary brush for beating the floor;
a rotary brush motor for activating the rotary brush;
means for detecting the floor condition; and
means for controlling the rotary brush motor in accordance with the detected floor condition.

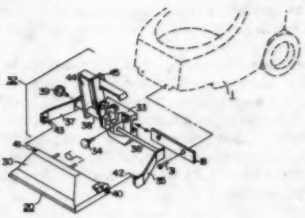
4,953,254

SPRAY EXTRACTOR

Albert Kohl, Solothurn, Switzerland, and Roland Schunter, Lorch-Waldhausen, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 372,108, Jun. 28, 1989, abandoned, which is a continuation of Ser. No. 199,968, May 27, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 451,844
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718166
Int. Cl.[5] A47L *11/30*
U.S. Cl. 15—320 **12 Claims**

1. A mobile cleaner apparatus comprising a container for a cleaning preparation and an associated pressure pump which are integrated into a mobile and steerable chassis, said chassis having a steering handle and comprising a holder for a suction unit having an integrated soil container, a coupling means for fastening to the front side of said chassis a spray nozzle and suction nozzle unit having a roller, said coupling means comprising a fastening rail or bar fixed to and extending substantially across the entire lower front side of said chassis, said coupling means including a clamp block having a groove therein designed to slide over and onto said fastening rail or bar



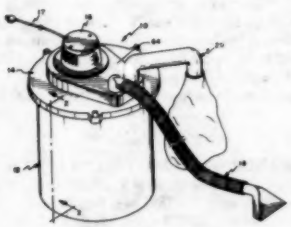
wherein said clamp block is provided with a screw to secure said clamp block to said fastening rail or bar, said coupling means being also provided with a mounting frame connected to the housing of said spray nozzle and suction nozzle unit, whereby said coupling means enables lateral displacement of said spray nozzle and suction nozzle unit with respect to said chassis, said spray nozzle being suitable for applying a cleaning preparation to a surface to be cleaned and said suction nozzle being suitable for sucking up the applied cleaning preparation.

4,953,255

PORTABLE HOT ASH VACUUM

Overton S. Jenkins, 6206 Sedgefield Dr., Norfolk, Va. 23513

Filed Mar. 16, 1989, Ser. No. 324,443
Int. Cl.[5] A47L *5/36*
U.S. Cl. 15—327.02 **6 Claims**



1. A portable vacuum cleaner for vacuuming hot ashes, comprising:
a canister having an outer housing and an inner housing;
said inner and outer housings each having side walls, a bottom wall, and a top wall;
at least the side walls and bottom wall of the inner housing being spaced inwardly from the side walls and bottom wall of the outer housing, defining a dead air space therebetween;
vacuum producing means supported on said canister for producing a vacuum to vacuum up ashes and deposit them in said inner housing, said vacuum producing means comprising a motor having a suction side communicating with the interior of the inner housing, and a discharge side communicating with ambient atmosphere; and
thermal insulating material on the side and bottom walls of

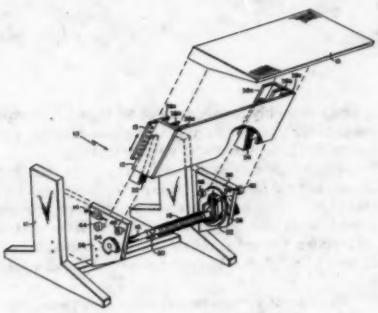
one of said inner and outer housings for cooperating with said dead air space to thermally insulate the temperature of hot ashes in the inner housing from the walls of the outer housing.

4,953,256

COUNTERBALANCE MECHANISM

Gordon O. Salmela, Lexington, and Michael L. Pizzarella, Shrewsbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 6, 1989, Ser. No. 306,733
Int. Cl.[5] E05D *13/00*; F16M *11/00*
U.S. Cl. 16—1 C **16 Claims**



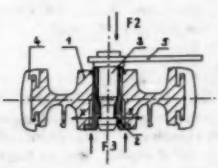
1. A counterbalance mechanism comprising:
means for guiding a movable portion of an apparatus along a vertical or inclined path;
shaft means disposed between stationary sides of said apparatus for providing a force to counter a force of gravity on said movable portion;
means for transferring said force to said movable portion in a constant manner independent of said movable portion position, said force transferring means comprises spiral gears disposed on a first end and a second end of said shaft means; and
rack gears attached to said movable portion guiding means in a vertically oriented position, each of said rack gears positioned to engage one of said spiral gears.

4,953,257

CASTER WHEEL

Seynhaeve: André G., Senlis, France, assignor to Delsey S.A., Bobigny Cedex, France

Filed Mar. 21, 1989, Ser. No. 326,061
Claims priority, application France, Apr. 5, 1988, 88 04424
Int. Cl.[5] B60B *5/00*, *30/00*
U.S. Cl. 16—45 **8 Claims**



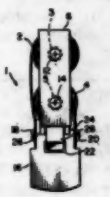
1. A wheel, notably for baggage such as a suit-case or a traveling bag, characterized by the fact that it includes a moulded rim inside the bore of which is resiliently engaged a brace moulded from a resiliently deformable material and a metallic axis forcibly crimped inside a bore of said brace, wherein said bore of the rim includes a cone with which cooperates a deformable end of said brace.

4,953,258

BALANCING ARRANGEMENT FOR DOUBLE HUNG WINDOWS

Anthony R. Mennuto, Paramus, N.J., assignor to Metal Industries, Inc., Elizabethville, Pa.

Filed Jul. 10, 1989, Ser. No. 377,327
Int. Cl.[5] E05F *1/02*
U.S. Cl. 16—197 **9 Claims**



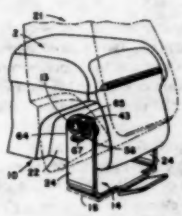
7. A balancing arrangement for use with a double hung window, comprising:
spring means secured to a window jamb;
balance shoe means secured to a corresponding window sash;
the spring means including a spring arrangement secured to the balance shoe means, and including means for supporting the spring arrangement;
the balance shoe means having a detent; and
the means for supporting the spring arrangement supporting means for engaging the detent when the spring arrangement is unextended.

4,953,259

ARMREST TORQUE CONTROL

Dale J. Frye; Kenneth M. Lindberg; Alan L. Kindig; Robert J. Stander; Joseph B. Buonodono; Jeffrey D. Gras, and David A. Ozios, all of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Continuation-in-part of Ser. No. 217,171, Jul. 11, 1988, Pat. No. 4,882,807. This application Sep. 22, 1989, Ser. No. 411,405
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[5] E05D *11/08*
U.S. Cl. 16—225 **12 Claims**



1. A torque control for use in conjunction with a component pivotally mounted to a support structure for pivotal movement about a pivot pin, said torque control comprising:
at least one cylindrical resistance element adapted to be fixedly mounted to one of said component or structure in

spaced relationship to the pivot pin, said resistance element having a predetermined diameter; and

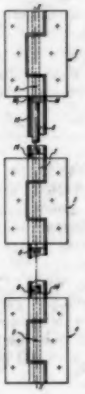
a member composed of a resilient polymeric material for attachment to the other of the component or structure, said member having at least one arcuate slot spaced from the pivot pin and receiving therein said resistance element for movement longitudinally therethrough as the component pivots about the pivot pin; said slot having a width dimension relatively smaller than said diameter of said resistance element, whereby a desired frictional resistance is obtained as the component is pivotally moved, and wherein means is provided to continuously vary the force exerted by the sides of said slot on said resistance element as it travels through substantially the entire arcuate length of said slot whereby a variable frictional resistance is provided on said resistance element as it slides along said slot.

4,953,260

AUTOMATIC DOOR CLOSER HAVING AN ADJUSTABLE TORSION SPRING AND CONFIGURED END FITTINGS

Jean A. Fargnier, 30-33 rue Roger Salengro, Fontenay Sous Bois (Val de Marne), France

Continuation of Ser. No. 149,134, Jan. 27, 1988, Pat. No. 4,845,811. This application May 30, 1989, Ser. No. 358,935
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[5] E05F *1/08*
U.S. Cl. 16—308 **5 Claims**



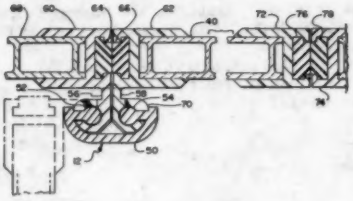
1. Automatic door closer comprising at least two hinges, each of which comprises two hinged components on an axis and one of which, known as the mobile component, is fixed on the door and the other one of which, known as the fixed component, is fixed on the post of the door, a steel spring torsion bar, a first connecting means connecting one end of the steel spring torsion bar to the fixed component of a hinge, a second connecting means connecting the other end of the bar to the mobile component of another hinge, one of these connecting means comprising means for determining restoring torque of the door so as to bring the door back automatically into the closed position, a tube disposed about the bar between the hinges wherein the tube is provided with a lateral slot along its length thereby enabling said tube to be located on said bar after said bar has been regulated for torsion movement, one end of the tube being held coaxially on the bar by a washer sliding freely about the bar and inside the tube.

4,953,261

WATERPROOF HINGED PANEL ASSEMBLY

Donald D. Lyons, 204 W. Telegraph, Dowagiac, Mich. 49047

Filed Aug. 10, 1988, Ser. No. 230,850
Int. Cl.[5] E05D *7/00, 1/04, 11/00*
U.S. Cl. 16—354 **7 Claims**



1. A hinge assembly for a hinged panel assembly comprising:

a linear hinge channel having a first side section, a second opposed side section and a bottom section;

a first linear side projection extending from said first side section toward said second side section along the length of said channel and having a rounded linear protruding end;

a second linear side projection extending from said second side section toward said first side section along the length of said channel and having a rounded linear protruding end;

a first attachment section having a first front face, a first end face and a first linear hinge projection extending normal to said front face, said first linear hinge projection including a first linear socket rotatably engaging said rounded end of said first linear side projection along its length and a first linear hinge bearing surface opposite said first linear socket;

a second attachment section having a second front face, a second end face and a second linear hinge projection, said second linear hinge projection including a second linear socket rotatably engaging said rounded end of said second linear side projection along its length and a second linear hinge bearing surface opposite said second linear socket;

said first and second linear hinge bearing surfaces being adapted to matingly meet each other when the first and second attachment sections are rotated about the first and second rounded linear protruding ends, respectively, within the hinge channel;

a first sealing strip attached to said first attachment section along said first end face; and

a second sealing strip attached to said second attachment section along said second end face for sealing abutment with said first sealing strip;

said first and second attachment sections being rotatable with respect to said linear hinge channel between an open position in which said first and second front faces are parallel and a closed position in which said first and second end faces are located in opposing adjacent relation and said first and second sealing strips abut at an interface plane to provide a water-tight seal.

4,953,262

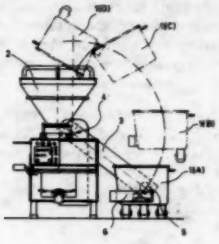
MACHINE FOR PROCESSING MEAT

Georg Zinser, Winterstettenstadt, Fed. Rep. of Germany, assignor to Albert Handtmann, Maschinenfabrik GmbH & Co. KG, Biberach an der Riss, Fed. Rep. of Germany

Filed Apr. 3, 1989, Ser. No. 332,072
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1988, 3812931
Int. Cl.[5] A22C *5/00*
U.S. Cl. 17—1 R **14 Claims**

1. A machine for processing meat, particularly sausage meat, comprising a supply hopper supported on top of the machine,

a lift arm mounted for pivoting about a horizontal axle at a fixed position on the machine and carrying a horizontal rotatable tipping shaft, and a carrier frame for a mobile sausage meat container secured to said tipping shaft for rotation in unison therewith, characterized in that between said lift arm axle (4) and said tipping shaft (5) there is provided a first chain transmission (16) having a transmission ratio of 1:1 for guiding said sausage meat container (1) parallel to itself as said lift arm



(3) is raised and lowered, and a second cross-connected chain transmission (19) having a transmission ratio greater than 1 for causing said sausage meat container (1) to be tipped, the driving sprockets (17,20) of said chain transmissions being mounted on said lift arm axle (4) for free rotation thereabout, and adapted to be alternately coupled thereto for rotation therewith, while the driven sprockets (18,21) are non-rotatably secured to said tipping shaft (5).

4,953,263

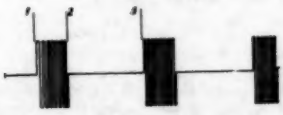
PROCESS FOR STUNNING LIVESTOCK

Elbert Lambooy, Veenendaal, Netherlands, assignor to Stichting Instituut Voor Veeteeltkundig Onderzoek "Schoonoord", Zeist, Netherlands

Continuation-in-part of Ser. No. 240,755, Sep. 2, 1988, Pat. No. 4,875,253. This application Sep. 25, 1989, Ser. No. 411,899

Int. Cl.[5] A22B *3/00*

U.S. Cl. 17—1 E 2 Claims



1. In a process for stunning livestock by means of a low frequency electrical current surge transmitted briefly through electrodes to the animal to be stunned, the improvement comprising prior to sticking the animal, administering a stunning alternating current surge followed by an intermittent alternating current surge, the frequency of which is a multiple of the frequency of the stunning current surge.

4,953,264

METALLIC WIRE USED WITH TEXTILE FIBER PROCESSING ELEMENTS, IN PARTICULAR, WITH CLEANING ROLLERS

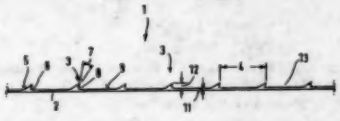
John D. Hollingsworth, Greenville, S.C., and Akiva Pinto, Gastonia, N.C., assignors to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Jun. 20, 1988, Ser. No. 209,016

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723872

Int. Cl.[5] D01G *15/84*

U.S. Cl. 19—114 22 Claims



1. Metallic toothed wire for processing textile fibers having a wire portion, said toothed wire comprising:

a plurality of teeth having a tooth distance defined between adjacent teeth of at least 10 mm creating lengthy trough interspaces;

said teeth having a low height profile defined by an upper tooth tip which extends above a tooth base to a height of about one third of said tooth distance;

said tooth having a low rear inclination which ascends in a rear inclination over about half said tooth distance from said tooth base to said tooth tip;

an undercut having an undercut inclination extending downwardly from said tooth tip, said under cut inclination terminating at a transitory inclination which terminates at said tooth base;

a positive front angle between said rear inclination and said undercut inclination being within a range of 10 degrees to 40 degrees; and

said low height profile and lengthy trough interspaces of said teeth being constructed and arranged to contain fiber material in said interspaces with waste particles generally unbroken with increased separation of said waste particles from said interspaces over the low height profile of said teeth.

4,953,265

DEVICE FOR DETECTING NEPS IN CARDED, TEXTILE FIBER MATERIAL

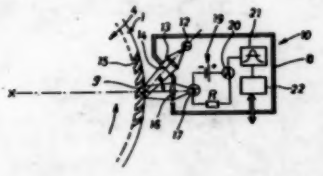
Hans-Jürgen Scheinhütte, Schindellegi, Switzerland, assignor to Gebrüder Loepfe AG, Kempten, Switzerland

Filed Mar. 1, 1989, Ser. No. 317,299

Claims priority, application Switzerland, Mar. 2, 1988, 785/88

Int. Cl.[5] D01G *15/46*

U.S. Cl. 19—297 8 Claims



1. A device for detecting neps in a textile fiber fleece band, said fiber fleece band being transported along a transporting path through a carding machine, said device comprising:

illuminating means arranged at a distance from said trans-

porting path and having light emitting means for illuminating a defined area of said transporting path, said area having an extension transverse to the direction of the transporting path;

light sensing means arranged in a distance of said transporting path and having at least one imaging optics being provided for projecting an image of said illuminated area of said fiber fleece band on an image plane, and said light sensing means being arranged in said image plane; and

at least one evaluation circuit connected to said light sensor, said evaluation circuit having a differentiating circuit for forming a first or second derivative of the sensor signal and circuit means for analyzing said differentiated signal.

4,953,266

ONE-PIECE PLASTIC CLIP

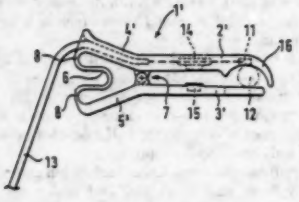
Karl Trinkaus, Darmstadt, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Aug. 16, 1989, Ser. No. 394,827

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 8810826

Int. Cl.[5] A41F *1/00*; A44B *21/00*

U.S. Cl. 24—499 **8 Claims**



1. A one-piece plastic plastic clip having one end and another end comprising two clamping members at said one end and two speadable handles at said other end, a pivot bearing structured for assembly by snapping-together, a U-shaped compression spring located inside said spreadable handless and connecting said spreadable handles together, and a Reed-Contact located in one of said clamping members and a permanent magnet located in the other of said clamping members, said clamping members each having a free end portion.

4,953,267

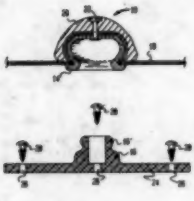
MALE ELEMENT FOR HEAVY DUTY SNAP FASTENER

John G. Marino, 12 Sandra Ct., Huntington, N.Y. 11746, and Michael Topputo, 18 Meadowbrook Dr., Brentwood, N.Y. 11717

Filed Mar. 29, 1989, Ser. No. 330,568

Int. Cl.[5] A44B *1/18*

U.S. Cl. 24—682 **2 Claims**



1. A snap fastener and support assembly comprising:

(a) a generally circular male member and a generally circular female member adapted to releasably interlock with one another;

(b) an elongated base plate adapted for mounting the male member of the snap fastener, said base plate being integral and unitary with said generally circular male member;

(c) said base plate having a generally planar bottom surface;

(d) said integral base plate and male member being formed of a generally weather-resistant and slippery plastic;

(e) said integral male member and base plate having mounting means for mounting said base plate and male member to a support surface, said mounting means comprising two openings passing through said base plate and a third opening passing through said male member, and three screws or the like extending through said three openings; and

(f) a vehicle cover mounted in combination with the female member whereby the female member is fastened over the male member when the cover is in position.

4,953,268

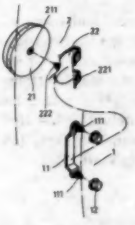
SAFETY DRESS FASTENER

C. C. Chang, 1F. No. 19, Alley 52, Lane 245, Sec. 4, Ba-Deh Rd., Taipei, Taiwan

Filed Jan. 10, 1990, Ser. No. 463,211

Int. Cl.[5] A44B *1/18*

U.S. Cl. 24—694 **1 Claim**



1. A safety dress fastener, including:

a male member comprised of a retaining plate having two unitary screws upstanding from its both ends, and two safety nuts screwed up with said two screws to secure to a dress; and

a female member comprised of a decorative button having a center bolt hole, and a hook element, said hook element comprising a hook portion and a screw portion, said screw portion being screwed in said center bolt hole of said decorative button and secured to said dress at a position corresponding to said male member so that said hook portion can hook on said retaining plate to fasten up said dress.

4,953,269

SWIMMING POOL ANCHOR AND REMOVAL TOOL

Kelly Ragsdale, Salt Lake City, Utah, assignor to Cover-Pools, Inc. A Utah Corporation, Salt Lake City, Utah

Filed Jul. 7, 1989, Ser. No. 377,235

Int. Cl.[5] F16B *19/00*; B25B *13/16*

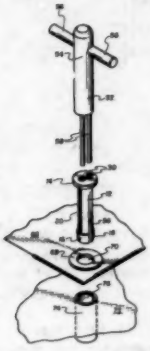
U.S. Cl. 24—704.1 **19 Claims**

1. The combination of fastener and removal tool comprising:

a resilient, collapsible fastener means for use in detachably securing together a first member, which defines an aperture therethrough, and a second member, having a receiving aperture therein, said fastener means being sized to be inserted through said first member aperture and received within said second member aperture, thereby forming a detachable union of said first and second member; said fastener means including an abutment means mounted thereon, sized to preclude an insertion thereof through said first member aperture; said abutment means defining a plurality of spaced openings therethrough, each said opening being dimensioned to receive slidably a respective said elongate member, each of said openings being

configured to direct a respective elongate member into a biased engagement against said fastener means; and

a removal means for removing said fastener means from its securement positioning through said first member aperture and in said second member aperture, said removal means including a plurality of elongate members sized to



be inserted through a said first member aperture and positioned in biased contact against said fastener means to effect a collapse of said fastener means while providing a pressure-fit connection with said fastener means to facilitate a withdrawal of said fastener means upon a withdrawal of said removal means.

4,953,270

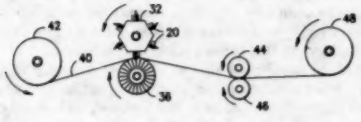
METHOD FOR MARKING TEXTILE SUBSTRATES

Michael W. Gilpatrick, Chesnee, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 4, 1987, Ser. No. 93,365

Int. Cl.[5] D06C *23/00*

U.S. Cl. 28—163 **3 Claims**



1. A method for marking a textile fabric, said fabric comprised of a plurality of yarns oriented in a first direction and a plurality of yarns oriented in a second, substantially perpendicular direction, said former and latter yarns defining a fabric plane, said method comprising simultaneously

(a) forming an incision in said fabric by inserting a planar member having a sharpened edge, which penetrates said fabric plane and which is parallel to said first direction, thereby cutting yarns oriented in said second, substantially perpendicular direction without cutting said yarns oriented in said first direction;

(b) disentangling those portions of cut yarns nearest said incision from uncut yarns nearest said incision which are oriented in said first direction; and

(c) displacing said disentangled yarn portions nearest said incision from said fabric plane.

4,953,271

INTERMINGLING NOZZLE

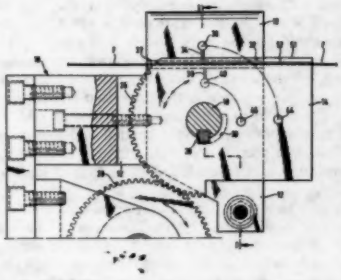
Herbert Wellenhofer, Bobingen; Ingolf Jacob, Untermeitingen, and Josef Geirhos, Bobingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 20, 1989, Ser. No. 410,311

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832283

Int. Cl.[5] D02G *1/16*; D02J *1/08*

U.S. Cl. 28—272 **12 Claims**



1. An intermingling nozzle for filaments or yarns, comprising a plurality of plates arranged side by side in the manner of a reed forming yarn channels which are in a parallel arrangement and blowing medium channels which end transversely in the yarn channels, the axes of the yarn channels being in a plane which extends perpendicularly to the plates, wherein pairs of mutually adjoining plates consist of a stationary yarn channel plate (12) and a mobile closing plate (14), of which the yarn channel plate (12) is provided on its side which faces the closing plate (14) with a groove (32) which serves as a yarn channel and the closing plate (14) is movable parallel to the plate planes between an open position which gives access to the yarn channel and a closed position which covers up the yarn channel.

4,953,272

WHEELED VEHICLE TIRE WHEEL MOUNTING AID

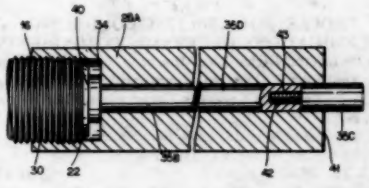
James C. Gevas, One Ford La., Roseland, N.J. 07068

Continuation-in-part of Ser. No. 164,326, Mar. 4, 1988, Pat. No. 4,847,971. This application Apr. 4, 1989, Ser. No. 333,125

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[5] B25B *27/14*

U.S. Cl. 29—273 **2 Claims**



1. For aligning and mounting a tire wheel onto a wheeled vehicle wherein subsequent securing of said tire wheel onto said vehicle is accomplished with vehicle tire wheel mount studs and mating lug nuts, an apparatus, comprising:

(a) an adapter, a first part of a detachable two-part mount stud extension assembly which is hollow along its longitudinal axis, wherein at one end of and centered around the

longitudinal axis of said adapter is an extender alignment hole with an internal hole end which opens into the internal cavity of said adapter, wherein the surrounding face of said internal hole end is formed by an annular face region of the structure of said adapter, and the outer end of said extender alignment hole opens into the outermost face of said adapter at that adapter longitudinal end, wherein there is an adapter threaded end at the other end of the longitudinal axis of said adapter at which centered around the longitudinal axis of said adapter are internal threads which fit those of a mating vehicle tire wheel mount stud; and,

(b) an extender, the second part of said detachable two-part mount stud extension assembly, wherein said extender consists of an unheaded shaft section which butts against a headed end section with which it is approximately coaxial, wherein said headed end section has radial lengths which exceed those of any of the radii of said unheaded shaft section, wherein at the unheaded end of said extender at that end of the longitudinal axis of said extender which is opposite from said headed end section said unheaded shaft section has means for the attachment of an extension to said unheaded shaft section of said extender; and,

(c) wherein said detachable two-part mount stud extension assembly is assembled by the insertion of the unheaded shaft section end of said extender into and through said internal hole end of said extender alignment hole of said adapter, said insertion of said extender continuing through as far as continued insertion travel freedom permits, wherein the longest radial length of said headed end section of said extender is shorter than the shortest radial length of said internal cavity of said adapter body along its longitudinal length from said adapter threaded end to its said annular face region surrounding its said internal hole end of its said extender alignment hole, and wherein when said detachable two-part mount stud extension assembly is mounted onto a mating vehicle tire wheel mount stud by screwing said internal threads of said adapter onto the external threads of a mating vehicle tire wheel mount stud said extender is captured along its longitudinal axis in the direction towards said vehicle tire wheel mount stud by the outermost face of said vehicle tire wheel mount stud and is captured along its longitudinal axis in the direction away from said vehicle tire wheel mount stud by said annular face region of said adapter which surrounds said internal hole end of said extender alignment hole of said adapter, wherein said detachable two-part mount stud extension assembly at its adapter end extends outwards in the direction away from the vehicle at least as far as does said unheaded end of said extender and further than do the rest of the vehicle tire wheel mount studs which are not mated with said detachable two-part mount stud extension assembly.

4,953,273

PROCESS FOR APPLYING CONDUCTIVE TERMINATIONS TO CERAMIC COMPONENTS

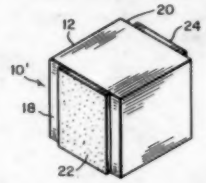
Victor D. Insetta; Richard V. Monsorno, both of Jacksonville, Fla., and John F. Dorrian, Simpsonville, S.C., assignors to American Technical Ceramics Corporation, Huntington Station, N.Y.

Filed May 25, 1989, Ser. No. 356,518
Int. Cl.[5] H01G *4/12*
U.S. Cl. 29—25.42 **18 Claims**

1. A process for applying a plurality of conductive paths on the exterior of a ceramic component having an unsintered ceramic body comprising the steps of:

applying said paths to said body said paths being composed of only a finely divided metal, and finely divided ceramic particles substantially the same as the ceramic of said body, in an organic carrier;

applying a termination layer over said paths, said termination layer having finely divided metal in a liquid carrier and finely divided ceramic particles of substantially the same ceramic as that of said body; and



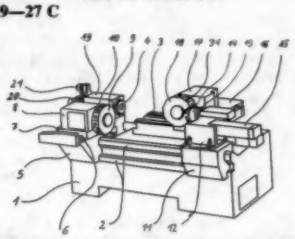
cofiring said body, said paths and said termination layer to integrate the same into a monolithic integral unit.

4,953,274

MACHINE TOOL WITH TWO WORKPIECE SPINDLES

Gerhard Rehage, Gütersloh; Manfred Staege, Melle, and Hans W. Grünkemeier, Werther, all of Fed. Rep. of Germany, assignors to Gildemeister Aktiengesellschaft, Bielefeld, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,587
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 8713204[U]
Int. Cl.[5] B23B *3/30*
U.S. Cl. 29—27 C **4 Claims**



1. A machine tool, comprising two workpiece spindles having a common spindle axis and located axially opposite to one another, at least one of said workpiece spindles being movable in an axial direction for transferring a workpiece from a clamping location to a working location; at least two tool carriages; guide means for supporting each of said at least two carriage for movement parallel to the spindle axis and perpendicular to the spindle axis, a first tool turret supported on one of said at least two carriages and having a first indexing axis extending perpendicular to the spindle axis; and a second tool turret supported on another of said at least two tool carriages and having a second indexing axis extending parallel to the spindle axis and perpendicular to said first indexing axis, each of said first and second turrets having a plurality of tool receptacles formed so that tools received in said tool receptacles extend substantially radially to a respective one of said first and second indexing axes.

4,953,275

PROCESS FOR MANUFACTURING ALLOY WHEELS FOR VEHICLE TIRES

Hiroshi Mori, 2751 Aqua Verde Cir., Los Angeles, Calif. 90077

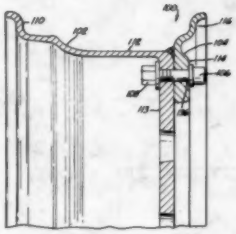
Filed Nov. 27, 1989, Ser. No. 441,888
Int. Cl.[5] B21D *22/16*
U.S. Cl. 29—894.324 **14 Claims**

10. A process forming a two-piece vehicle wheel comprising the steps of:

roll-forming a perimeter portion of a circular plate to draw material in the perimeter portion radially outwardly therefrom and reduce the transverse dimension of said perimeter portion;

bending the roll-formed perimeter portion of the plate to define a first rim flange and a rim spanning portion;

roll-forming a perimeter portion of an annular disc to draw material in the perimeter portion radially outwardly therefrom and reduce the tranverse dimension of said perimeter portion of said disc;



bending the roll formed perimeter portion of the disc to define a second rim flange; and

securing together said plate and said disc such that said rim spaning portion extends horizontally between said first and second rim flanges to define said wheel.

4,953,276

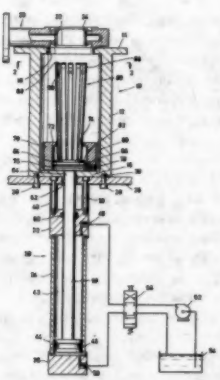
APPARATUS FOR INSERTING VALVE SEATS IN VALVE BODIES

Daniel P. Kusmer, Stafford, and Paul A. Yohner, Houston, both of Tex., assignors to Keystone International Holdings Corp., Houston, Tex.

Filed Jul. 21, 1989, Ser. No. 383,370

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—235 **9 Claims**



1. An apparatus for inserting a resilient valve seat into a valve body, said valve body having a radially inwardly projecting annular rib, said annular rib defining a bore through said valve body, said valve seat being generally annular and having an annular web portion, a first annular flange portion projecting radially outwardly from a first end of said web portion and a second annular flange portion projecting radially outwardly from a second end of said web portion thereby defining an annular, radially outwardly opening channel for receiving said rib, said first flange portion having an annular, inner surface partially defining said channel and an annular, radially outwardly facing surface, comprising:

a frame, said frame having an opening;

means for positioning said valve body adjacent said opening in said frame such that said opening in said frame and said bore in said valve body are in register; and

a plunger assembly slidably mounted in said frame, said plunger assembly including:

a mounting means,

a plurality of spaced, circumferentially disposed fingers secured to said mounting means, said fingers including engagement means having a first means to engage the inner surface of said first flange portion and a second means to position adjacent said radially outwardly facing surface of said flange portion,

said plunger assembly further including means, operatively connected to said mounting means, to effect positioning of said fingers between a first, compressed position when said mounting means is in a first position in said frame and means to expand said fingers into a second, expanded position when said mounting means is in a second position in said frame and said fingers are positioned such that said engagement means is positioned on the opposite side of said valve body from said frame,

means to move said plunger assembly such that said fingers can be selectively reciprocated through said opening in said frame and said bore in said valve body and that said engagement means can be positioned on the opposite side of said valve body from said frame, whereby said valve seat can be disposed such that said first means of said engagement means engages said inner surface of said first flange portion and said second means of said engagement means is positioned adjacent said radially outwardly facing surface of said first flange portion whereby as said plunger means is moived in a direction toward said frame, said annular rib compresses said fingers inwardly and said valve seat is radially, inwardly distorted sufficient to permit said first flange portion to pass through said bore defined by said rib.

4,953,277

MANUFACTURING PROCESS FOR AN ELECTRONIC DEVICE

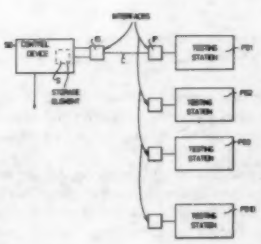
Norbert Crispin, Markgroeningen; Hartmut Schumacher, Stuttgart; Harald Vogt, Schwieberdingen, and Rudolf Eisenbarth, Salzgitter, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 7, 1989, Ser. No. 390,644

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 3828988

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—407 **10 Claims**



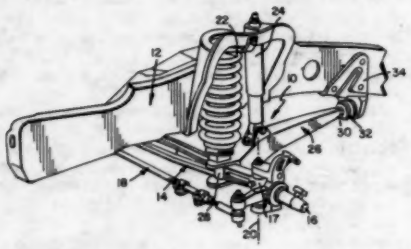
1. A manufacturing process for an electronic device having a storage element, comprising testing the device during a plurality of manufacturing stages at respective testing stations, and after being tested at a respective testing station, storing information relating to an inspection step performed at the respective inspection station in the storage element of the electronic device.

4,953,278

METHOD FOR ADJUSTING ALIGNMENT OF A WHEEL

Gerald A. Specktor, St. Paul, and John Specktor, Golden Valley, both of Minn., assignors to Shim-A-Line, Inc., Minneapolis, Minn.

Division of Ser. No. 83,564, Aug. 7, 1987. This application Jan. 19, 1989, Ser. No. 300,026
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—402.06 13 Claims



1. A method for adjusting alignment of a wheel attached to a vehicle having a rod member affecting the alignment, the rod member having a portion disposed within a bushing, the rod member and the bushing being adjacent, the method comprising:

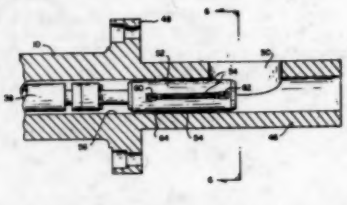
inserting between the rod member and the bushing a shim along one side of the rod member to adjust the alignment of the wheel.

4,953,279

METHOD AND APPARATUS FOR GROOVING THE BARREL OF A PLASTICATING MACHINE

Paul N. Colby, New Castle, Pa., assignor to Spirex Corporation, Youngstown, Ohio

Filed Oct. 6, 1989, Ser. No. 418,238
Int. Cl.[5] B23P *6/00*
U.S. Cl. 29—402.06 6 Claims



1. A method for machining grooves on the interior surface of the barrel of a plasticating machine having a rotating screw, said method comprising

a. removing said screw from said barrel,

b. transporting a grooving device having radially adjustable cutting elements to the plasticating operating site of said barrel,

c. inserting one end of said grooving device into said barrel so that the cutting elements are disposed within said barrel at one end of the barrel and the other end of said grooving device including reciprocating motive means extends outwardly from said barrel at the other end of said barrel,

d. fixing the angular and longitudinal position of the grooving device within said barrel,

e. attaching to said barrel at said other end of said barrel a support brace with said brace providing support for said other end of said grooving device,

f. adjusting the radial position of said cutting elements, and

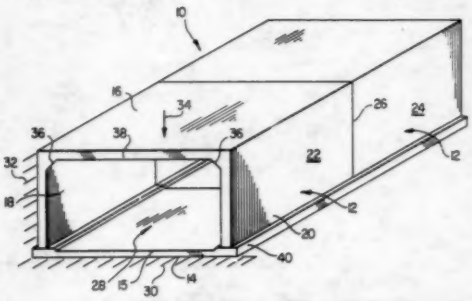
g. subjecting said grooving device to reciprocating movement to cut grooves into the interior surface of said barrel.

4,953,280

METHOD OF MANUFACTURING PRESTRESSED CONCRETE CULVERTS

James K. Kitzmiller, Dallas, Tex., assignor to Gifford-Hill & Company, Inc., Dallas, Tex.

Continuation of Ser. No. 57,772, Jun. 3, 1987, abandoned. This application Jan. 11, 1990, Ser. No. 464,588
Int. Cl.[5] B23P *17/00*; B28B *7/02, 7/24, 11/14*
U.S. Cl. 29—412 15 Claims



1. A method for efficiently manufacturing a plurality of three-sided, reinforced modular concrete culverts in an upside-down position, each of said culverts comprising two opposite sidewalls and a top slab formed therebetween, said method comprising the steps of:

providing a casting table having two opposite sidewalls, said sidewalls forming a pour cavity therebetween, said pour cavity providing for the formation of the top slabs of said plurality of inserted modular concrete culverts;

providing at least two adjacent pairs of sidewall forms, each sidewall form having a first sidewall form part and a second sidewall form part opposite to said first sidewall form part, said first and second sidewall form parts when in engagement with each other forming a chamber therebetween within which reinforcing steel is placed, each pair of sidewall forms in cooperation with said pour cavity of said casting table providing for the formation of each of said modular concrete culverts including said opposite sidewalls and said top slab formed therebetween;

positioning at least one prestressing tendon in said pour cavity of said casting table;

securing reinforcing steel within said chamber of each of said sidewall forms;

resting said at least two adjacent pairs of sidewall forms upon and across said casting table sidewalls in a generally parallel, spaced relationship one to the other, said chambers projecting generally perpendicularly upward from said casting table sidewalls, thereby providing for the formation of adjacent concrete culverts;

stressing said at least one tendon by exerting a force from outside said pour cavity;

pouring concrete into said pour cavity of said casting table and over said at least one prestressed tendon;

pouring concrete into said chambers of said at least two adjacent pairs of sidewall forms;

cutting said at least one tendon at an intermediate point between said two adjacent pairs of sidewall forms;

removing said at least two adjacent pairs of sidewall forms; and

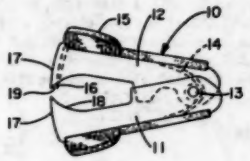
separating said plurality of inverted modular concrete culverts into individual reinforced modular concrete culverts, said plurality of inverted modular concrete culverts disposed in side-to-side relationship along said casting table, said individual modular concrete culverts each having first and second opposite sidewalls and said top slab formed therebetween.

4,953,281

METHOD OF MAKING A STAPLE REMOVER

Yun L. Wang, 424 Barrenwood Dr., Wadsworth, Ohio 44281

Division of Ser. No. 7/173,267, Mar. 25, 1988, Pat. No. 4,903,945. This application May 19, 1989, Ser. No. 354,455
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—438 11 Claims



1. A method of manufacturing a staple removing device comprising the steps of;

forming a pair of extraction means in a first plane to be provided on first and second levers respectively;

each of said extraction means having a spaced apart oppositely positioned pair of points at one end of said extraction means, and one of said pair of extraction means having a projection forming an engaging member located intermediately between said points and formed integrally therewith;

bending said extraction means on said first and second levers such that said points will extend in a plane substantially perpendicular to said first plane;

bending said engaging member such that it is disposed intermediately between said points of one of said bent extraction means and forms an engaging gap with both of said extraction points thereof;

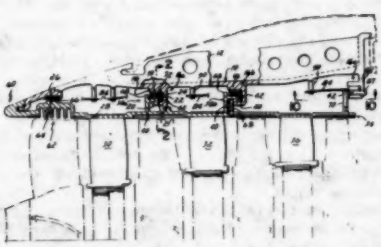
pivotally coupling said levers at one end thereof with said extraction means provided thereon such that said extraction means are movable toward each other whereby said staple will be engaged by said gap and the points of the other of said extraction means to thereby uniformly remove the ends of said staple by said extraction means.

4,953,282

STATOR VANE MOUNTING METHOD AND ASSEMBLY

Robert J. Corsmeier, Cincinnati, and James S. Kelm, Milford, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 142,584, Jan. 11, 1988, Pat. No. 4,868,963. This application Jun. 26, 1989, Ser. No. 371,142
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—451 12 Claims



1. The method of mounting a first element to a second element, comprising:

providing spaced, first and second clamping surfaces on the first element;

providing a flange on the second element, said flange being formed with first wedge lock elements extending outwardly from a surface thereof;

positioning a locking spring having outwardly extending second wedge lock elements upon said surface of said flange so that said second wedge lock elements on said locking spring extend between adjacent first wedge lock elements on said flange;

inserting both said locking spring and said flange between said spaced first and second clamping surfaces;

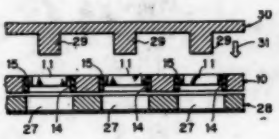
moving said locking spring relative to said flange so that said first wedge lock elements on said flange engage said second wedge lock elements on said locking spring and thereby force said locking spring against said flange and one of said first and second clamping surfaces, said locking spring and said flange being tightly wedged between said first and second clamping surfaces for connecting the first element to the second element.

4,953,283

METHOD OF HANDLING ELECTRONIC COMPONENT CHIPS

Shoichi Kawabata; Hisanao Tsuge, and Hiromichi Wakatsuki, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 28, 1988, Ser. No. 276,618
Claims priority, application Japan, Nov. 28, 1987, 62-301062
Int. Cl.[5] B23P *11/02;* H05K *3/30*
U.S. Cl. 29—593 21 Claims



1. A method of handling a plurality of electronic component chips each having dimensions along longitudinal, crosswise and perpendicular directions measured orthogonal to each other, wherein said longitudinal dimension has the longest size and said crosswise dimension has the second longest size, said method comprising:

preparing an electronic component chip holder which is provided with a plurality of receiving portions defined by through holes for receiving respective ones of said plurality of electronic component chips, each of said receiving portions having a sectional configuration capable of receiving said longitudinal and crosswise dimensions of each said electronic component chip and being provided with an elastic member on at least a pair of opposite portions of an inner peripheral surface defining each said receiving portion for elastically holding each said electronic component chip;

inserting respective ones of said plurality of electronic component chips into said receiving portions to longitudinally and crosswisely orient the same toward the sectional direction of said receiving portions while elastically holding the same by said elastic member, thereby to hold said plurality of electronic component chips by said electronic component chip holder;

wherein the electronic component chips are inserted into the holder such that each of said electronic component chips is received in a respective one of said receiving portions and selected regions of said chip are exposed through respective openings of said receiving portion;

contacting said exposed regions of said chips through said openings while holding said chips in said component chip holder; and

handling said plurality of electronic component chips while holding the same by said electronic component chip holder;

wherein said exposed regions of the chip are external terminal electrodes on both ends along the longitudinal direction of the chip, and said contacting step includes contacting said exposed external terminal electrodes through said openings.

4,953,284

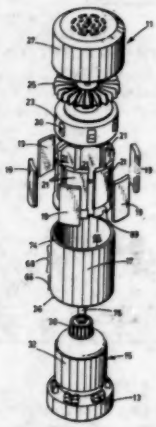
METHOD FOR RETAINING A MAGNET WITHIN A MOTOR ASSEMBLY

Joe K. Hammer, Bowling Green; Alan H. Fitzsimmons, and Hans Greutmann, both of Toledo, all of Ohio, assignors to Prestolite Electric Incorporated, Toledo, Ohio

Division of Ser. No. 285,091, Dec. 15, 1988, Pat. No. 4,916,344. This application Dec. 1, 1989, Ser. No. 432,500

Int. Cl.[5] H02K *15/14*

U.S. Cl. 29—596 **2 Claims**



1. A method of assembling a plurality of magnets in a motor having a pair of end head assemblies with rotatable bearings, an armature assembly mounted in the rotatable bearings and a frame with a cylindrical portion surrounding a coil area of the armature assembly, each of said magnets having a magnetic shield comprising

providing a plurality of first locating legs on the first end head assembly;

providing a plurality of second locating legs on the second end head assembly;

mounting one end of the armature assembly into the bearing of one of said end head assemblies;

mounting the frame onto the one end head assembly having the cylindrical portion of the frame surrounding the coil area of the armature assembly, said step of mounting including positioning the frame against said one end head assembly;

providing a plurality of magnet shields with each shield having a first and second locating tab;

securing said magnets in said shields;

sliding each magnet and its respective shield between the coil area of the armature and the cylindrical portion of the frame;

locating each of the magnet shield relative to the said one end head assembly by engaging the first locating tab on each of the shields with a respective one of said first locating legs; and

positioning the second of said end head assemblies onto the other end of said armature, said step of positioning including engaging the second locating tab on each of the shields with a respective one of said second locating legs for retaining said shields relative to the armature assembly.

4,953,285

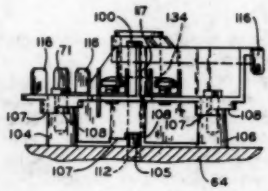
METHOD OF ASSEMBLING A DYNAMOELECTRIC MACHINE

Lynn E. Fisher, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 195,852, Jul. 15, 1988, Pat. No. 4,853,303, which is a division of Ser. No. 134,312, Dec. 17, 1987, Pat. No. 4,788,763, which is a division of Ser. No. 864,048, May 16, 1986, Pat. No. 4,716,326, which is a division of Ser. No. 522,620, Aug. 12, 1983, Pat. No. 4,593,162. This application May 31, 1989, Ser. No. 359,702

Int. Cl.[5] H02K *15/14*

U.S. Cl. 29—596 **21 Claims**



1. A method of assembling a dynamoelectric machine, the dynamoelectric machine including at least one end frame having at least one face, a rotatable shaft having at least one end portion with the at least one end portion extending through the at least one end frame generally about a centerline axis of the dynamoelectric machine, a plurality of mounting posts extending from the at least one face, a plurality of first surfaces respectively on the mounting posts with each first surface being predeterminately spaced from the at least one face and arranged to span a preselected arc about the centerline axis, a terminal board having a plurality of sets of stepped surfaces thereon, a switch device on the terminal board and having a set of contact means operable generally for making engage*ment and for breaking engagement, a centrifugal switch actuating mechanism disposed on the at least one end portion and conjointly rotatable with the shaft, and a cover, the method comprising the steps of:

disposing the terminal board adjacent the at least one face of the at least one end frame;

arranging the contact means of the switch device on the terminal board at least generally in collinear relation with the centerline axis of the dynamoelectric machine for operation by the centrifugal switch actuating mechanism;

overlaying the stepped surfaces on the terminal board at least in part with the first surfaces on the mounting posts, respectively;

adjustably rotating the terminal board generally about the centerline axis into an adjusted assembly position;

maintaining the collinear relation of the contact means with the centerline axis during the adjustably rotating step;

locating respective ones of the stepped surfaces in abutment with the first surfaces, respectively, during the rotating step;

adjusting the spacing between the terminal board and the at least one face and between the contact means and the centrifugal switch actuating mechanism in response to the locating step;

releasably securing the terminal board to the mounting posts against displacement from the adjusted assembly position of the terminal board; and

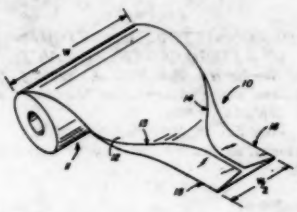
assoiciating the cover with the dynamoelectric machine in a position to enclose at least the terminal board, the switch device, the at least one face, the at least one end portion of the shaft, and the centrifugal switch actuating mechanism.

4,953,286

METHOD OF MAKING A TRANSFORMER CORE

Maurice J. Boenitz, Lenox, Mass., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Dec. 12, 1988, Ser. No. 299,927
Int. Cl.[5] H01F 41/02
U.S. Cl. 29—606 3 Claims



1. A method of producing a transformer core, comprising:
providing a strip of amorphous metal material having a length with a longitudinal axis and a width, wherein said length is substantially greater than said width;
folding said strip of amorphous metal material along a line parallel to said longitudinal axis;
forming a core segment or segments from the folded strip of amphorous metal material;
arranging the segment or segments in the shape of a transformer core; and
annealing the segmer or segments.

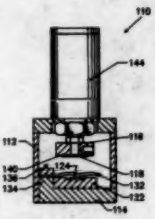
4,953,287

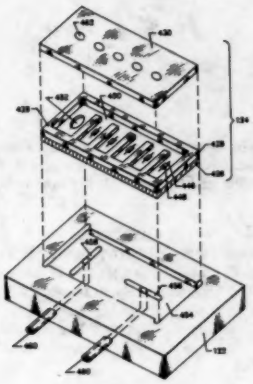
THERMAL-BONDING PROCESS AND APPARATUS

William J. West, Los Altos; Howard H. Taub, San Jose, and Robert J. Miller, Burlingame, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 1, 1987, Ser. No. 68,874
Int. Cl.[5] H05B 3/00
U.S. Cl. 29—611 10 Claims

5. A method for bonding a precision laminate comprised of at least two layers, the method comprising the steps of:
a. positioning a precision laminate on a vacuum chuck between a base and a thin pliable sheet, the pliable sheet when subjected to a pressure differential being capable of:
i. pressing against the precision laminate; and
ii. conforming precisely to the surface contours of the precision laminate so that a uniform pressure is applied to a surface of the precision laminate;
b. maintaining the positioning of the precision laminate when applying heat and pressure to the precision laminate by maintaining a partial vacuum in the vacuum chuck;
c. heating the precision laminate; and
d. applying a uniform pressure to the surface of the precision laminate by applying a pressure differential across the thin pliable sheet by using a chamber in which is defined an inlet outlet port and an opening that the thin pliable sheet is placed across so that a fluid-tight chamber is formed,





wherein the application of heat and uniform pressure bonds the precision laminate together.

4,953,288

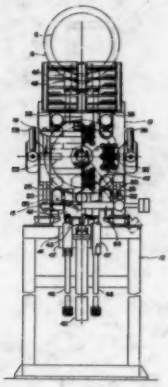
WHEEL PRESETTING APPARATUS

Hiromi Sakurai, Nagoya, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1989, Ser. No. 394,810
Claims priority, application Japan, Aug. 30, 1988, 63-213578; Aug. 30, 1988, 63-213579; Aug. 30, 1988, 63-213580
Int. Cl.[5] B23P 21/00
U.S. Cl. 29—704 11 Claims

1. A wheel presetting apparatus, including:
a pair of driven lower rollers for supporting a wheel;
a pair of upper rollers mounted above said lower rollers, and movable into engagement with an upper side of a wheel supported on said lower rollers;
a synchronous driving means for moving said lower and upper rollers towards and away from each other;
a center pin supported for forward and backward movement in relation to a center hole of a wheel held by said upper and lower rollers;

a bolt hole detecting means for detecting the position of bolt holes in a wheel rotated by said lower rollers; and



a hub pin supported for forward and backward movement and insertable into a bolt hole angularly displaced from a bolt hole detected by said bolt hole detecting means.

4,953,289

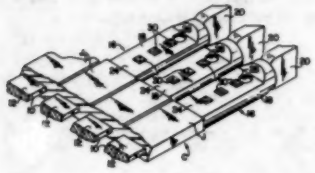
CONDUCTOR TERMINATING METHOD

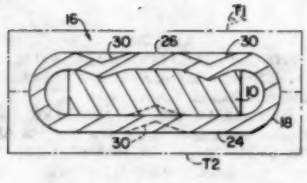
Daniel J. Schreck, Lansdale, and Ronald G. Ehrmann, Warrington, both of Pa., assignors to Pyle Overseas B.V., Amsterdam, Netherlands

Filed Jun. 5, 1989, Ser. No. 361,178

Int. Cl.[5] H01R *43/04*

U.S. Cl. 29—863 **6 Claims**





1. A method for terminating a solid flat conductor of indeterminate length having a generally rectangular cross-section and comprising the steps of forming a terminal including an axially elongated seamless tubular barrel portion having a cylindrical bore, flattening said tubular barrel portion to flatten the cross-sectional configuration of said bore to generally complement the cross-sectional configuration of an associated end portion of said solid flat conductor, inserting said associated end portion of said solid flat conductor into said flattened bore, and simultaneously swaging opposing flattened surfaces of said barrel portion forming a plurality of spaced apart columns of indentations in one of said opposing surfaces and at least one column of indentations in the other of said opposing surfaces, the indentations in said other opposing surface being out of opposing registry with the indentations in said one opposing surface, said indentations deforming said associated end portion within said bore.

4,953,290

METHOD OF CONNECTING HEAT EXCHANGE TUBES TO A FLUID CONVEYING DUCT

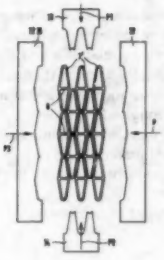
Alfred Jabs, Groebenzell, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 385,012

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1988, 3825486

Int. Cl.[5] B21D *53/02*

U.S. Cl. 29—890.043 **15 Claims**



1. A method of securing the ends of heat exchange tubes to a heat exchanger duct, said method comprising

arranging heat exchange tubes in a matrix in which the tubes are of U-shape and form in the matrix straight leg portions connected by a bend region, the tubes in the straight leg portions being spaced from one another,

bending the straight leg portions of the tubes proximate the ends thereof to reduce the spacing of the tubes at said ends and bring the ends into proximity with one another,

encircling the ends of the tubes with frame elements,

applying compression force to said frame elements to deform the ends of the tubes so that the tubes contact one another over substantially the entire surfaces thereof,

heating the tubes and frame elements to unite the tubes to one another and to said frame elements to form a unified block assembly,

inserting said unified block assembly in an opening in a heat exchanger duct which has the same shape as the unified block assembly, and

joining said block assembly to said duct in fluid-tight sealed relation.

4,953,291

TIRE INTERIOR SUPPORT SYSTEM

Edward G. Markow, Oakdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 9, 1988, Ser. No. 281,714

Int. Cl.[5] B60C *17/06*

U.S. Cl. 29—894.351 **4 Claims**

1. An insert for use in a tire and allowing a tire to operate in a run-flat condition, the insert comprising:

means for attaching the insert to a tire rim;

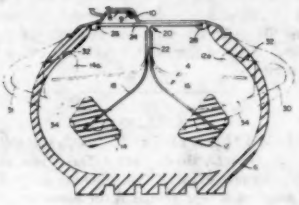
a pair of flexible annular contoured discs connected to the attaching means and extending radially and axially out-

wardly therefrom in opposite axial directions such that each disc forms a frusto-conical geometric figure; and

a circular elastomeric member attached to the outer periphery of each disc, the member being in normally non-contacting relation with the tire interior surface when installed within the tire, each member having a generally trapezoidal cross-section;

the discs having sufficient flexibility for deflecting correspondingly attached elastomeric members into respective bulging folds of a deflected tire side wall thereby preventing collapse of the tire.

3. A method for enhancing a tire for run-flat operation and comprising the steps:



positioning two continuous flexible discs within the interior of the tire;

securing a circular elastomeric member to an outer peripheral edge of each disc;

orienting the elastomeric members toward opposite sides of the crown of the tire in normally non-contacting relation when the tire is inflated;

attaching a radially inward peripheral edge of each disc to a wheel rim thereby providing a structure for transferring load forces from the tire to the rim;

wherein tire collapse is prevented by displacement of the elastomeric members into interposed relation with interior side wall areas constituting bulging folds which develop upon tire deflation.

4,953,292

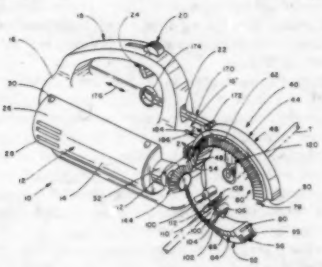
HAND-HOLDABLE TUBE CUTTING DEVICE

Billy D. Tobey, 23736 E. Virgin St., Catoosa, Okla. 74015

Filed Sep. 26, 1989, Ser. No. 412,340

Int. Cl.[5] B23D *21/08*

U.S. Cl. 30—97 **9 Claims**



1. A hand-holdable tube cutting device comprising:

(A) a case unit which includes

(1) a housing having a top portion and a forward portion, and

(2) a handle mounted on said housing top portion, said handle including an on/off switch movably mounted thereon and a draw-back shaft passage defined therethrough adjacent to said housing forward portion;

(B) a tube clamping unit which includes

(1) a hinge amount fixed to said housing forward portion,

(2) a bipartite race connected to said hinge mount and including a top semicircular section movably connected at one end thereof to said hinge mount and having another end diametrically opposite to said one end, a bottom semicircular section movably connected at one end thereof to said hinge mount and having another end diametrically opposite to said bottom section one end, said race top and bottom sections being essentially equal in size to form a circular race when said another ends are in contact,

(3) each of said race sections being hollow and rectangular in cross section and having a top surface, a bottom surface and side surfaces connecting said top and bottom surfaces together with an opening being defined through said bottom surface of each race section, said race section openings cooperating to define a continuous circular channel when said race sections are locked together at said another ends,

(4) a bipartite driven bevel gear slidably mounted on said race and including a semicircular top segment, a semicircular bottom segment, with each segment including a mounting section having a first face, a second face and a top connecting said first face to said second face of each mounting segment, said driven bevel gear segments being essentially equal in size to form a circular element, with said top segment having a projection on one end thereof and said bottom segment having a mating lock element on one end thereof for co-operation with said projection to lock said top segment to said bottom segment to form a circular bevel gear when said top segment is locked to said bottom segment, with said section channels being located to define first and second essentially continuous circular channels in said mounting sections, said circular channels being located and sized to slidably engage said race side surfaces adjacent to said race channels to slidably mount said driven bevel gear on said race to rotate with respect to said race,

(5) two supporting roller units mounted on said driven bevel gear bottom segment,

(6) a tube sanding roller unit mounted on said driven bevel gear bottom segment between said roller units,

(7) a tube cutter unit mounted on said driven bevel gear top segment for movement therewith and including a cutting wheel mounting section, a biasing means, a cutting wheel mounted to be biased by said biasing means toward said sanding roller unit;

(C) a bevel gear driver unit which includes

(1) a motor mounted in said case unit housing and including a drive shaft and means connecting said motor to a power source and to said on/off switch,

(2) a driver bevel gear mounted on said motor drive shaft for rotation therewith and in a position to drivingly engage said driven bevel gear when said driven bevel gear top segment is locked to said driven gear bottom segment; and

(D) a race moving draw-back shaft connected at one end thereof to said race top section and extending through said case unit draw-back shaft passage for movement toward and away from said case unit housing forward end to move said race sections together and apart.

4,953,293

ELECTRICIAN'S UTILITY KNIFE

Dennis J. Sterlacci, P.O. Box 7043, Cumberland, R.I. 02864

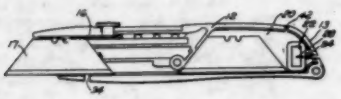
Filed May 19, 1989, Ser. No. 354,385

Int. Cl.[5] B25F *3/00*

U.S. Cl. 30—124 **2 Claims**

1. In a utility knife for electricians a handle having two members detachably secured together and separated along a central longitudinal plane, a slot at one end of the handle, a blade carrier adjacent said end of one of the members mounted for movement, a blade held by said carrier to leave the cutting

edge unobstructed, that improvement comprising a notch in the handle adjacent the said end of a depth to allow the blade to protrude therein and permit insulation on a wire to be cut, an oblong aperture in each of the members that form a transverse



passageway for receiving sheath covered parallel electric cable, a cutting blade partially protruding into the passageway centrally thereof and on a plane perpendicular to the longitudinal extent of said members for engaging the sheath of electrical cable.

4,953,294

PORTABLE HANDHELD TOOL HAVING A DRIVE SHAFT ROTATABLY JOURNALLED IN A PROTECTIVE TUBE

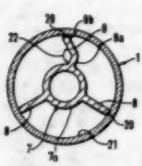
Hans-Peter Dohse, Kernen-Rommelshausen, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

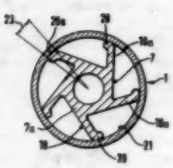
Filed Nov. 20, 1989, Ser. No. 438,056

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839548

Int. Cl.[5] B26B *7/00*; A01D *34/68*

U.S. Cl. 30—276 **8 Claims**





1. A portable handheld tool such as a brushcutter driven by a motor, the portable handheld tool comprising:

a housing for accommodating the motor therein;

a protective tube which can be subjected to vibrations during operational use of the tool, the protective tube having a rearward end connected to said housing and having a forward end, said tube also having an inner wall surface;

a work tool assembly mounted on said forward end;

a drive shaft mounted in said protective tube for connecting said motor to said work tool assembly;

a bearing sleeve unit arranged in said protective tube and which can be subjected to radial pressure forces when mounted in said tube;

said bearing sleeve unit including an annular-like center portion defining a bearing opening for holding and guiding said drive shaft within said protective tube, said center portion having an outer surface in spaced relationship to said inner wall surface of said protective tube;

said bearing sleeve unit further including a plurality of supporting ribs extending outwardly from said outer surface to brace said bearing sleeve unit against said inner wall surface for supporting and centering said bearing sleeve unit within said protective tube; and,

at least one of said ribs being configured to extend approximately tangentially to said annular-like center portion so as to be resilient in a direction extending radially outwardly from said annular-like center portion thereby substantially isolating said annular-like center portion from said pressure forces and said protective tube from said vibrations.

4,953,295

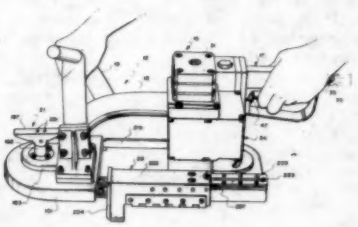
SEAWATER HYDRAULIC BAND SAW

Scott Barradas, Oxnard; Bruce Farber, Oak View, and William B. Luther, Oceanside, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1990, Ser. No. 479,490

Int. Cl.[5] B27B *13/08*

U.S. Cl. 30—380 **16 Claims**



1. A portable band saw which uses pressurized seawater as the operating fluid comprising:

a drive wheel having a pulley tire on the periphery thereof, said pulley tire having an abrasive strip attached thereto;

a driven wheel having a pulley tire on the periphery thereof, said pulley tire having an abrasive strip attached thereto;

a continuous band-type saw blade mounted on said drive and driven wheels;

motor means having an inlet port, an exhaust port, and a shaft, the inlet of said motor means being adapted for receiving pressurized seawater so as to activate said motor means thereby causing the shaft thereof to rotate;

control means connected to the inlet port of said motor means and having a trigger, the trigger of said control means when engaged allowing pressurized seawater to pass through said control means to said motor means thereby activating said motor means;

means for transmitting the rotational motion of the shaft of said motor means to said drive wheel, said transmitting means being lubricated by pressurized seawater provided through the exhaust port of said motor means;

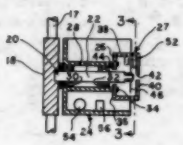
adjustment means for changing said saw blade by moving said driven wheel toward said drive wheel and thereby relaxing tension on said saw blade and then tightening said saw blade by moving said driven wheel away from said drive wheel; and

frame means supporting said drive and driven wheels, said transmitting means, said control means, said motor means and said adjustment means.

4,953,296
METHOD AND APPARATUS FOR PROVIDING RUNOUT COMPENSATION

Phillip A. Spainhour, Nashville, Tenn., assignor to J. P. Hennessy, LaVergne, Tenn.

Filed Aug. 24, 1989, Ser. No. 398,001
Int. Cl.[5] G01B 7/315
U.S. Cl. 33—203.18 **6 Claims**

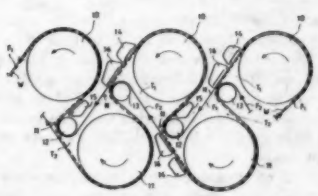


1. In a wheel alignment system, the combination comprising support means adapted to be mounted to a wheel of a vehicle,
a shaft extending from said support means in substantial coaxial relationship with the axis of rotation of said wheel,
a gauge head rotatably carried by said shaft for pendulous movement relative to said shaft,
sensor means carried by said gauge head for making wheel alignment measurements, and
encoder means mounted between said shaft and said gauge head for producing a signal indicative of the angular position of said wheel relative to said gauge head.

4,953,297
METHOD AND DEVICE FOR POCKET VENTILATION IN THE DRYING SECTION OF A PAPER MACHINE, IN PARTICULAR FOR HIGH-SPEED PAPER MACHINES

Pekka Eskelinen; Pentti Raatikainen, both of Turku; Markku Karlsson, Parainen, and Raimo Virta, Turku, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

PCT No. PCT/FI87/00065, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/08898, PCT Pub. Date Nov. 17, 1988
PCT Filed May 13, 1987, Ser. No. 295,607
Int. Cl.[5] F26B 5/00
U.S. Cl. 34—23 **12 Claims**

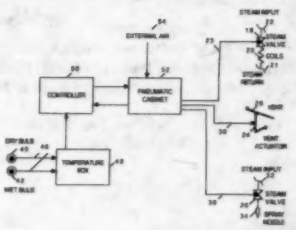


1. Method of operating multi-cylinder dryers of a paper machine, where said dryers comprise two lines of drying cylinders (10, 11), in whose connection a twin-wire draw is applied so that, by means of a first and second drying wire (F1, F2), a closed draw is obtained in the transfer of a paper web (W) from one cylinder line onto another, and in which method, a closed draw is provided, guide rolls (12/13) of the respective first and second drying wires (F1/F2) are placed at the proximity of the run of the other wire (F2/F1) on which the drying wire runs from its drying cylinder (11/10) to its guide roll (13/12) whereat air is blown through said drying wires (F1/F2) so as to ventilate pockets (T1/T2) defined by said wires and free faces of the drying cylinders (10/11), characterized in that an air jet or air jets (S1) are used as ventilation blows, said jets being directed at the run of the first and second drying wires (F1/F2) at which the respective drying wire (F1/F2) runs from its drying cylinder (11/10) onto its guide roll (13/12), that said air jets are applied within said run of the drying wire (F1/F2) in the area in which the respective drying wire (F1/F2) contacts a portion of the web (W) supported by the other respective drying wire (F2/F1) which runs over a segment of the circumference of the guide roll of the other respective drying wire (F2/F1) and in which blow area there is a widening wedge space (N) defined by the respective drying wire (F1/F2) and its guide roll (13/12), through which wedge space the pocket ventilation blowing takes place.

4,953,298
KILN CONTROLLER

John L. Carter, Portland; Michael M. Sprague, Tigard; Crosby Stone, Eugene, and James A. Felsheim, Rogue River, all of Oreg., assignors to Wagner Electronic Products, Inc., Rogue River, Oreg.

Filed Feb. 24, 1989, Ser. No. 315,153
Int. Cl.[5] F26B 11/12
U.S. Cl. 34—44 **14 Claims**



1. In a kiln controller for controlling the drying of lumber in a kiln, and comprising measuring means for measuring an evaporation rate of moisture in the lumber, and a computer controlling a schedule for drying the lumber, the schedule having a plurality of steps of variable duration, each step having temperature set points, a method comprising the steps of:
(a) comparing the measured evaporation rate to a desired evaporation rate,
(b) adjusting the schedule in accordance with the comparison between the measured and desired evaporation rates, and
(c) repeating (a) and (b) until the schedule is completed;
wherein the kiln has a vent with a plurality of positions, and wherein measuring the evaporation rate comprises measuring a vent load of the vent, said vent load indicating the position of the vent.

4,953,299
PROCESS AND APPARATUS FOR FREEZE-DRYING COMPRISING MEANS FORMING AN ACTIVE THERMAL SHIELD BETWEEN THE FREEZE-DRYING SHELVES

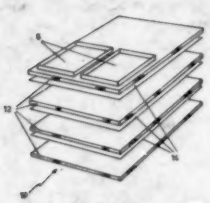
René Gimeno, Pelussin; Alain Huc, Ste Foy Les Lyon, and Pierre DeVictor, La Mulatiere, all of France, assignors to Societe Anonyme, Bioetica, Lyon, France

Filed Nov. 16, 1988, Ser. No. 272,483
Claims priority, application France, Nov. 17, 1987, 87 15880
Int. Cl.[5] F26B 5/06
U.S. Cl. 34—92 **14 Claims**

1. An apparatus for freeze-drying viscous solutions which may be in a comprising:
a freeze-drying enclosure;
freeze-drying shelves disposed inside the freeze-drying en-

closure to support the products or solutions to be freeze-dried;

first means for adjusting the temperature associated with each of the freeze-drying shelves; and



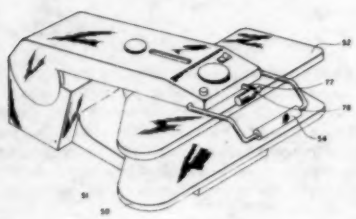
means forming an active thermal shield disposed between the freeze-drying shelves, the shield means including second means for adjusting the temperature to slow down heat exchanges between the product or solution to be freeze-dried and the temperature adjusting means associated with the shelves.

4,953,300

STEAM IRONING PRESS

Donald R. Davidson, Chatham; Pao-Ter Huang, Edison, and H. 'David Rogers, Fanwood, all of N.J., assignors to SSMC Inc., Edison, N.J.

Filed Jul. 31, 1989, Ser. No. 388,124
Int. Cl.[5] D06F *71/34*
U.S. Cl. 38—36 **6 Claims**



1. A steam iron press adapted to press an article of fabric and comprising:

first and second generally horizontal members, the first member being fixed in position and having an exposed upper surface, the second member having an exposed lower surface with orifices therein and being movable toward and away from the first member so that the exposed lower surface is moved toward and away from the exposed upper surface, said article being disposed removably upon the upper surface for pressing, the pressing action ensuing when the second member is moved toward the first member until the article is squeezed between the two exposed surfaces;

a manually operated mechanism connected to the second member to move said second member into any position between a position of maximum separation and a position of minimum separation (engagement) with respect to the first member;

said second member receiving water supplied thereto and heating said water into steam, the steam being expelled through said orifices in such manner that the article when squeezed is pressed using heat and steam;

a reservoir containing water;

a pump connected between said second member and said reservoir, said pump when actuated feeding water under pressure from the reservoir to the second member and when deactuated preventing flow of water from said reservoir to said second member; and

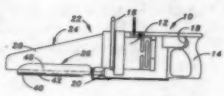
a cam device connected between the mechanism and the pump to actuate the pump during a predetermined interval t between the instant of time T1 at which the mechanism has initiated movement of the second member toward the first member and the instant of time T2 at which the article is squeezed between the two surfaces wherein the duration of the invnterval t is less than that of the interval (T2—T1), said device otherwise deactuating the pump, said device including a stationary cam having a cam surface engaged by a movable follower, the follower being coupled to the pump.

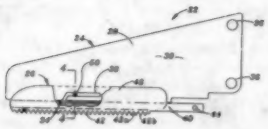
4,953,301

REPLACEABLE SAW BLADE AND GUIDE

Howard L. Dobbs, Jr., R.R. #5, Box 173-A, Emporia, Kans. 66801

Filed Dec. 26, 1989, Ser. No. 456,510
Int. Cl.[5] B27B *11/02, 33/02*
U.S. Cl. 30—392 **3 Claims**





1. A blade assembly adapted for connection to a reciprocating saw having a housing and means for reciprocating a cutting blade, said assembly comprising:

an elongated, planar support plate adapted for securement to said housing and presenting a main body portion, a lowermost, elongated, fore-and-aft extending bladeengaging margin, and structure defining an elongated slot extending from said margin and along the length of the support the thickness of said blade-engaging margin being essentially equal to or greater than the thickness of said main body portion; and

an elongated, reciprocable cutting blade adapted for connection to said saw reciprocating means and presenting an elongated, lowermost cutting surface, a pair of upwardly extending, laterally spaced apart flanges each extending a fore-and-aft distance which is at least about 50% of the length of said lowermost cutting surface and each terminating at the lower end thereof at a point above said lowermost cutting surface, and a crosspiece extending laterally between and coupled to said flanges,

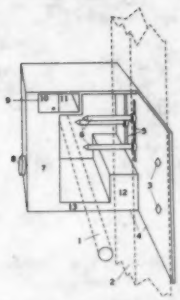
said blade being operably coupled with said support blade with said crosspiece slidably received in said slot and with said flanges extending upwardly from said plate lower margin a substantial distance in closely adjacent relationship with the opposed faces of said main body portion, said crosspiece being disposed below the upper margins of said flanges.

4,953,302

INTELLIGENT ARCHERY SIGHTING DEVICE

Russell P. Gould, P.O. Box 262, Youngstown, Pa. 15696

Filed Sep. 29, 1989, Ser. No. 414,378
Int. Cl.[5] F41G *1/46*
U.S. Cl. 33—265 **7 Claims**



1. A bow-mounted archery sighting device for aiding an archer in correctly aiming at a target situated at a distance and at an elevation relative to the archer, said archery sighting device comprising:

i. multiple sights adjustable for windage and elevation, each such sight provided with a means of individual identification,

ii. a manually operated optical distance-measuring system which indicates the distance to said target by providing for the controlled alignment of two views from differing angles of the same target,

iii. pendulum means responsive to the angle of inclination or declination of the bow in the vertical plane of the bow,

iv. sight-indicating means controlling the selective identification of one or two adjacent sights, said sight-indicating means connected to and responsive to said distance-measuring system,

v. correcting means for compensating said sight-indicating means according to deflections of said pendulum means,

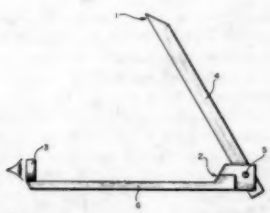
vi. housing means mounting said distance-measuring system said pendulum means sight-indicating means, and correcting means; the bow and said sights are adjustably affixed to said housing means.

4,953,303

TREE FELLING SPOTTER

Paul J. Carlin, 422 N. Austin, Oak Park, Ill. 60302

Filed Jan. 6, 1989, Ser. No. 294,302
Int. Cl.[5] G01C *1/00*
U.S. Cl. 33—284 **1 Claim**



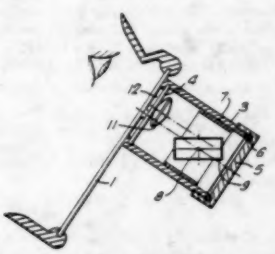
1. A clinometer type apparatus for translating a substantially vertical height to a generally non-perpendicular horizontal length along any pre-existing slope, said slope being generally non-perpendicular to said substantially vertical height, said apparatus comprising: a first elongate member and a second elongate member, said first and second elongate members being operatively attached to a common axis and being independently movable rlative to one another about said common axis through an arc of at least one-hundred eighty degrees (180°), sight means operatively attached to said first elongate member distal said common axis for sighting along a line extending therefrom through a forward sight means adjacent said common axis and for sighting along a line extending therefrom and intersecting an end of said second member distal said common axis and a top end of said substantially vertical object; said first member being aligned generally parallel with the generally non-perpendicular slope from which said substantially vertical object projects and said second member being aligned generally parallel with said substantially vertical object, said generally non-perpendicular length of said substantially vertical object being determined at a point along said slope when, with said first and second members adjusted in generally parallel alignment with respect to said slope and said vertical object, said sight means intersects a line formed between said end of said second member and said top end of said substantially vertical object; wherein said second elongate member has a first length measured from said common axis to said end of said second member and said first elongate member has a second length measured from said common axis to said sight means which is 0.6 inches less than said first length of said second member, a third length measured when said sight means of said clinometer apparatus is positioned against a user's eye, said third length being measured from the center of the user's eye to said common axis being substantially equal to said first length of said second member for providing dimensionally accurate translations.

4,953,304

MASK COMPASS

Raimo Raitmaa, Kauniainen, and Per-Olof Jansson, Helsinki, both of Finland, assignors to Oy Master Instruments Ltd., Finland

Continuation-in-part of Ser. No. 152,239, Feb. 4, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 343,826
Claims priority, application Finland, Feb. 4, 1987, 87 0472
Int. Cl.[5] G01C *17/02*
U.S. Cl. 33—355 R **21 Claims**



20. A mask compass mounted on goggles, comprising:

a watertight outer casing attached to the outer surface of a glass of the goggles, the casing having a transparent wall facing the glass;

a compass box mounted within the outer casing;

said compass box including a dial;

a compass needle mounted in the box; and

optical means mounted in the outer casing for enabling the diver to view the compass needle and dial;

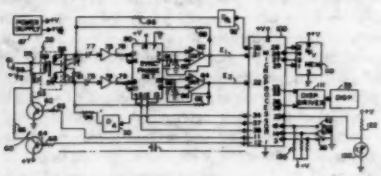
wherein a gap is provided between the outer casing and the glass in the path of light of the optical means said gap being washed by water.

4,953,305

VEHICLE COMPASS WITH AUTOMATIC CONTINUOUS CALIBRATION

Paul S. Van Lente, Holland, and Steven L. Geerlings, Zeeland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed May 27, 1987, Ser. No. 54,885
Int. Cl.[5] G01C *17/30*
U.S. Cl. 33—356 20 Claims



1. In an electronic compass system for use in a vehicle such as an automobile comprising:

sensing means for detecting the earth's magnetic field and for providing electrical signals representative of the direction of movement of the vehicle with respect to the earth's magnetic field;

circuit means coupled to said sensing means for providing display output signals representing heading information corresponding to the detected direction;

display means coupled to said circuit means for displaying the vehicle heading in response to said display output signals, wherein the improvement comprises:

said circuit means including means responsive to the direction representative signals for detecting the rate of change of said direction representative signals, and for determining if the rate of change exceeds a predetermined level thereby indicating the existence of invalid detected direction information; and means for providing an error output signal for display in response to said determining means determining that said rate of change exceeds said predetermined level.

4,953,306

FLEXIBLE CNC-MULTIPOSITION MEASURING INSTALLATION

Albert Weckenmann, Ahrensburg, and Hans-Jurgen Mordhorst, Glinde, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 183,828
Claims priority, application Fed. Rep. of Germany, May 5, 1987, 3714862
Int. Cl.[5] G01B *5/20*
U.S. Cl. 33—503 10 Claims

1. A multiposition measuring installation, comprising:

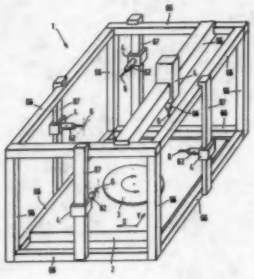
a framework;

a worktable located in said framework to support a workpiece;

a plurality of measuring devices to measure a multitude of parameters of the workpiece and to generate signals indicating values for said measured parameters;

support means connecting each of said measuring devices to the framework and supporting each of the measuring devices for movement therealong, each of said support means supporting each of the measuring devices for movement along the framework in two mutually orthogonal directions independent of all of the other of the measuring devices;

each of said measuring devices including a body and a sensor to sense a parameter of the work piece, the sensor of each measuring device being connected to the body thereof for movement in a direction orthogonal to the two directions in which the support means supports the measuring device for movement; and



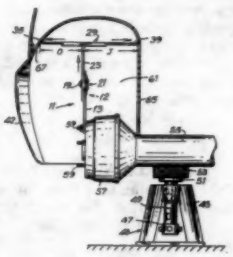
evaluation means connected to the measuring devices to receive said signals therefrom and to evaluate said signals according to a predetermined program, and to compare at least selected signals to corresponding reference values.

4,953,307

RIM OFFSET GAUGE

Theodore Loucas, 198-18 51st Ave., Bayside, N.Y. 11365

Filed May 3, 1989, Ser. No. 347,176
Int. Cl.[5] G01D *21/00*
U.S. Cl. 33—600 12 Claims



1. An apparatus for measuring fender well width in an automobile in order to determine the maximum sized tire or a wheel assembly which may be mounted on a hub mounting surface disposed in said fender well comprising:

a handle assembly;

means for independently and selectively adjusting the length of the handle assembly;

a head assembly connected to said handle assembly at the upper end thereof and substantially perpendicularly thereto;

means for independently and selectively adjusting the overall length of the head assembly in order to measure the fender well width;

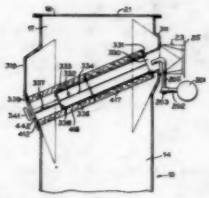
wherein said head assembly length adjusting means operates independently of said handle assembly length adjusting means.

4,953,308

FILTER SYSTEM FOR A FLUID BED GRANULATOR/DRYER

Aaron K. Basten, Solon, and Robert W. Claassen, Swisher, both of Iowa, assignors to Vector Corporation, Marion, Iowa

Filed Feb. 6, 1989, Ser. No. 306,102
Int. Cl.[5] F26B *21/06*
U.S. Cl. 34—82 4 Claims



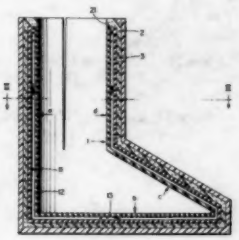
1. A fluid bed dryer machine comprising, a housing, an air inlet attached to a bottom portion of said housing, an exhaust outlet connected to an upper portion of said housing, fan means for moving air from said air inlet through said housing and said air outlet, first support means attached to said housing, a first pair of cylindrically-shaped pleated filters mounted end to end in said upper portion of said housing on said first support means and each formed with an axially extending central opening, one end of said central opening of a first one of said first pair of filters in communication with said air outlet and the other end of said central opening of said first one of said pair of filters in communication with one end of said central opening of a second one of said pair of filters, and sealing means mounted over the other end of said central opening of said second one of said first pair of filters, wherein said support means is formed with a central opening onto which said first pair of end to end cylindrical-shaped pleated filters can be received and said sealing means attached to said support means, including a second support means attached to said housing, a second pair of cylindrically-shaped pleated filters mounted end to end in said upper portion of said housing on said second support means adjacent to said first pair of cylindrically-shaped filters, each of said second pair of filters formed with an axially extending central opening, one end of said central opening of a first one of said second pair of filters in communication with said air outlet and the other end of said central opening of said first one of said second pair of filters in communication with one end of said central opening of a second one of said second pair of filters, and second sealing means mounted over the other end of said central opening of said second one of said second pair of filters, including a source of high pressure air, a first conduit which is attached to said source of high pressure air and extends so as to supply high pressure air into the central openings of said first pair of filters, a second conduit which is attached to said source of high pressure air and extends so as to supply high pressure air into the central opening of said second pair of filters, and first valve means mounted in said first conduit and second valve means mounted in said second conduit, and including control means connected to said first and second valve means and wherein said control means alternately opens and closes said first and second valve means so as to alternately clean said first and second pairs of filters.

4,953,309

WARMING FOOTWEAR

Stanislav Kaiser, Titovo Velenje, Yugoslavia, assignor to Alpina Tovarna Obutve N.Sol.O., Ziri, Yugoslavia

Filed Aug. 1, 1988, Ser. No. 226,734
Claims priority, application Yugoslavia, Sep. 4, 1987, 1644/87; Sep. 4, 1987, 1645/87
Int. Cl.[5] A43B *7/02*
U.S. Cl. 36—2.6 4 Claims



1. Warming footwear comprising:

an upper shoe having a shin portion, an instep portion, a toe portion and a calf portion,

an inshoe inserted in said upper shoe,

a ribbed plate incorporated in said inshoe and extending from said shin portion, over said instep portion and said toe portion to said calf portion,

a heat conducting, elastic foil entirely covering said ribbed plate and said foil forming a part of an inner surface of said inshoe, and

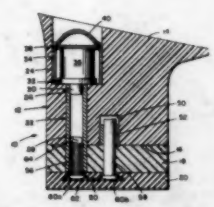
a heat exchanging system including one side of said ribbed plate includes a border rib defining a periphery of said ribbed plate and a partition rib extending from said calf portion to said instep portion and dividing said one side of said ribbed plate in two portions and said partition rib being everywhere spaced from said border rib, and said elastic foil being fastened to said periphery all along a length of said border rib, and either of two mutually interconnected conduits, which are limited by said ribbed plate, by said foil and by said partition rib, being filled with a heat transferring liquid flowing through said heat exchanging system, and two nonreturn valves being located in a path of said heat transferring liquid and being open in the same direction of the path of said heat transferring liquid.

4,953,310

SHOCK ABSORBANT HEEL

Richard J. Haug, 19 Sweetbriar La., Hampton, N.H. 03842

Filed Apr. 13, 1989, Ser. No. 337,396
Int. Cl.[5] A43B *21/26*
U.S. Cl. 36—38 11 Claims



1. A heel construction for shoes comprising a heel block

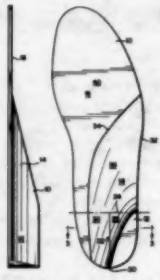
having a bottom surface and a top surface and a lift, a primary bore extending through said bottom surface, an elongated load transmitting means extending from the upper portion of the bore and through the bottom of the heel block, at least one secondary bore extending from the bottom surface into the heel block, a secondary post cooperating with the secondary bore adapted to move within said bore, means to transmit torque secured in the lift and moveably connected to the load transmitted means and to the secondary post whereby the lift is adapted for relative pivotal and vertical movement with reference to the heel block.

4,953,311

GOLF SHOES AND INSERTS FOR GOLF SHOES

Fred H. Bruggemeier, 1020 Aoloa Pl., #309-B, Kailua, Hi. 96734

Filed May 12, 1989, Ser. No. 351,409
Int. Cl.[5] A43B *13/38*
U.S. Cl. 36—127 **36 Claims**



1. A right insert and a left insert for a pair of golf shoes for a right handed golfer, said right insert having a right heel area and a right instep area and said left insert having a left heel area and a left instep area, comprising:

a right insert having a right maximum thickness in a rightward and rearward portion of said right heel area; and

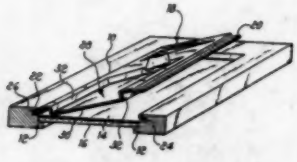
a left insert having a left maximum thickness in a rightward portion of said left instep area.

4,953,312

PANEL TO BE APPLIED TO BACK OF A PICTURE FRAME FOR RETAINING THE PICTURE AND ITS PROTECTIVE PANEL

Pietro Astolfi, Bologna, Italy, assignor to Pico-Glass, S.P.A., Cadriano, Italy

Filed Mar. 22, 1989, Ser. No. 327,292
Claims priority, application Italy, Oct. 4, 1988, 22176 A/88
Int. Cl.[5] A47G *1/06*
U.S. Cl. 40—156 **6 Claims**



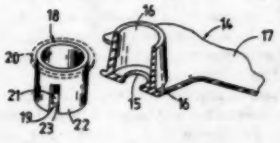
1. A rear panel for removable application to the rear of a picture frame, said picture frame having a picture receiving opening of a height and width for retaining a picture and an overlying protective panel in said frame opening, at least one of the width and height of said rear panel being greater than the corresponding dimension of said picture-receiving opening, said rear panel having a recess for projecting toward the picture when said frame and rear panel are assembled for use, said recess extending in area for a substantial portion of the total surface area of said rear panel, said recess having a substantially flat bottom that touches and retains said picture in the picture receiving opening when said frame and rear panel are assembled for use, said rear panel including two oppositely protruding borders at least along two opposite edges between which said greater dimension is defined, said borders being dimensioned to be received in corresponding longitudinal grooves in the picture-receiving opening of said frame, each said border being received in one of said grooves when said frame and rear panel are assembled for use, said borders being of an unequal width in the direction of said greater dimension, said rear panel being flexible and requiring flexing to enable insertion of said borders into said corresponding grooves, ease of assembly being enhanced by the uneven width of said borders.

4,953,313

EAR TAG FOR ANIMALS

Michael J. Scott, Feilding, New Zealand, assignor to Allflex New Zealand Limited, Palmerston North, New Zealand

Filed Dec. 21, 1988, Ser. No. 287,856
Claims priority, application New Zealand, Apr. 19, 1988, 224293
Int. Cl.[5] G09F *3/00*
U.S. Cl. 40—301 **12 Claims**



6. A female component for a two piece animal ear tag, said two piece animal ear tag including said female component and a male component, said male component having a stem with a head portion, said female component comprising:

(a) an opening through which the head portion can be forced to effect coupling of the male and female components, said opening having thereabout an annular wall within which at least the major portion of the head portion resides when the male and female components are coupled together;

(b) an insert located within the confines of the annular wall, said insert being in the form of a collar having an internal rim which projects inwardly from the inner wall surface of the collar and located adjacent the end of the collar which is located about said opening, the outer wall surface of the collar being in contact with the inner surface of the annular wall in an interference fit; and

(c) at least one longitudinally disposed slot being formed in the wall of the collar to extend part way along the wall from the end having the internal rim and through the rim, said at least one slot permitting the collar to be at least partially deformable to enable the head portion to enter into the collar whereupon the collar can return to a non-deformed state with the rim located behind the head portion to retain the head portion within the collar, said collar having an external flange disposed at the end of the collar opposite to that having the rim, whereby the external collar extends from the outer surface of the collar and over the end of the annular wall.

4,953,314
INERT GAS LIGHTING SYSTEM AND MEANS THEREFOR

Herbert F. Moulton, 4524 W. Marlette, Glendale, Ariz. 85301

Filed Feb. 28, 1986, Ser. No. 834,543
Int. Cl.[5] G09F *13/26*
U.S. Cl. 40—545 13 Claims

1. A system for wiring the secondary circuitry in an inert gas sign set-up without requiring an external sign cabinet to protect the set up from adverse weather conditions, said system comprising: a plurality of discrete sign characters disposed in a sequence, each of said characters having a tube of preselected shape operatively associated therewith, each said tube having a first end and a second end and being filled with an inert gas capable of glowing when excited by the application of high electrical voltage thereto; a plurality of discrete cable means, each having a proximal end and a distal end, each said proximal end of each said cable means being operatively connected to a different one of said tube first ends and said tube second ends; a high tension terminal box operatively interposed between each pair of adjacent sign characters in said sequence and having a housing member having a sidewall and a bottom, access means defined through said sidewall in equispaced relationship to each other, a terminal block centrally disposed within said housing member in spaced insulated relationship to said sidewall, said terminal block having first and second binder posts disposed therein in electrical communication with each other, each said binder post being adapted to receive and secure said distal end of said cable means extending from a different one of said adjacent sign characters to serially connect a pair of adjacent sign characters therethrough when said distal ends of said cables are secured thereto; a high voltage transformer having two posts; cable means connecting one of said transformer posts to said first end of said tube in the first character in said sequence and connecting the other of said posts to the said second end of said tube in the final of said characters in said sequence to complete the circuit through said sequence; and means for controlling said transformer to selectively energize and deenergize said inert gas in said tubing.

4,953,315
DISPLAY DEVICE FOR VEHICLES

Richard A. Romaine, 475 SW. View Crest Dr., Gresham, Oreg. 97080

Filed Dec. 27, 1988, Ser. No. 290,425
Int. Cl.[5] G09F *21/04*
U.S. Cl. 40—593 5 Claims

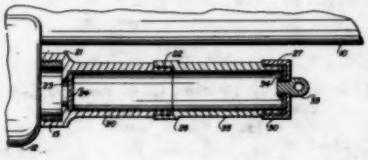
1. A display device for vehicles, comprising:
(a) an elongated case having a front face and a pair of opposite ends;
(b) suction cup mounting means for mounting the case on a vehicle, with its front face outermost;
(c) the front face having along its length a plurality of spaced display windows;
(d) an elongated slide mounted on the case for reciprocating sliding movement relative to the case and having a front face underlying the front face of the case;
(e) stop means limiting the reciprocating movement of the slide between first and second positions; and
(f) on the front face of the slide a plurality of spaced indicia positioned for viewing through the windows and spelling out first and second messages;
(g) the spacing of the windows in the case and the indicia on the slide being predetermined to present to view the first message when the slide is shifted to its first position by

application of a displacing force, and to present to view the second message when the slide is shifted to its second position upon the application of said force,
(h) the ends of the case being open and the suction cup mounting means being positioned one at each end and being provided with mounting posts extending transversely through the case ends, thereby providing the stop means limiting the reciprocating motion of the slide.

4,953,316
CHOKE STORAGE DEVICE FOR SHOTGUNS

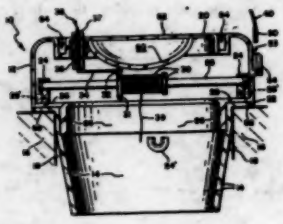
Ernest C. Litton, Sr., 5410 South 12th Ave., Tucson, Ariz. 85706, and Glen F. Thompson, 2701 W. Jennie La., Tucson, Ariz. 85713

Filed Sep. 25, 1989, Ser. No. 412,193
Int. Cl.[5] F41A *35/00*
U.S. Cl. 42—90 10 Claims



1. A choke holder device for a shotgun having a magazine for holding shells, said magazine having an end thereof closed by a removable cap, said choke holder device including in combination:
a first hollow choke storage member having first and second ends for storing at least one choke therein, said first storage member having releasable attaching means on the first end thereof for attaching said first end thereof to the magazine of said shotgun with the removable cap thereof removed, said first storage member being substantially closed at the first end thereof to close the end of the magazine of said shotgun; and being open at the second end thereof to permit the insertion of a choke therein;
a second hollow choke storage extender member with open first and second ends for storing at least one choke therein;
interconnecting means for releasably interconnecting the first end of said second choke extender member with the second end of said first choke storage member to form a continuous passageway through said first and second members; and
removable closure means for closing the second end of said second choke storage extender member.

4,953,317
NONFREEZING FISHING APPARATUS
James E. Ruchel, 423 Third St., Albany, N.Y. 12206
Filed Jul. 7, 1989, Ser. No. 376,833
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—17 **8 Claims**

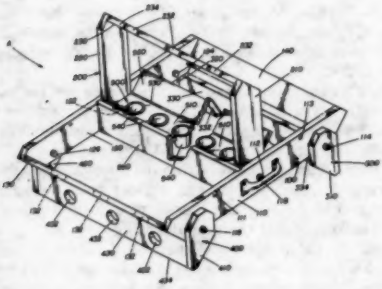


1. A portable totally self-contained and deployable, readily stackable ice fishing assembly comprising:

a dome-like shell of suitable, radiant energy absorbing material comprising a cover fixed to an annular, essentially planar base from which depends a short flange conterminous with the annular, internal edge of said base, said shell having a bracket mounted therein and on an interior surface of said shell for mounting a fishing line spoolpiece thereby wholly containing said bracket and spoolpiece; and,

a grooved morphalogical means on the outer top surface of said shell for fittably stacking a plurality of said shells, one such shell nested or stacked atop another by inserting the short flange into said grooved morphalogical means, whereby said ice fishing assembly is set up by taking it from a stacked storage array, fishing line is deployed from the internally mounted spoolpiece into an ice hole, and the assembly is placed in superposition on the hole with said base resting on the ice and said short annular base flange projecting part way into the hole.

4,953,318
FISHING ROD HOLDER
Adrian Vasseur, Jr., 2600 Wichita, Lot 65, Pasadena, Tex. 77502
Filed Jul. 10, 1989, Ser. No. 377,898
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—21.2 **20 Claims**



1. An apparatus for holding one or more fishing rods comprising:

a frame;

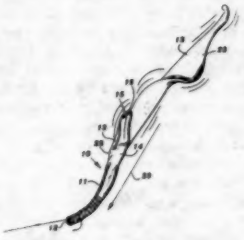
a rod support arm rotatably mounted to the frame at a point substantially midway of two opposing sides of the frame and which can upwardly rotate between a stored position parallel to the frame and a support position perpendicular to the frame;

a first support stand mounted to one end of the frame, which is perpendicular to the frame and which has means for inserting a portion of a fishing rod;

a second support stand mounted to the other end of the frame, which is perpendicular to the frame and which has means for inserting a portion of a fishing rod; and

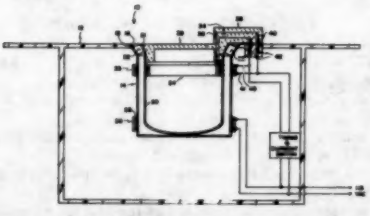
wherein the support arm operates in the support position to hold the fishing rod in a fishing position and rotates to a stored position when said fishing rod is supported by said first and second support stands in a carrying position.

4,953,319
MULTI-ATTRACTANT FISH BAIT
John M. Kasper, 11606 Timber Ridge La., Apt. 3, Sharonville, Ohio 45241; Maurice K. Perley, Jr., 1042 Royalton Rd., Orlando, Fla. 32825, and Bradley T. Gullett, 1590 Druid Rd., Maitland, Fla. 32751
Continuation-in-part of Ser. No. 274,001, Nov. 21, 1988. This application Jul. 25, 1989, Ser. No. 385,218
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.06 **19 Claims**



1. An artificial fish bait comprising a soft and bulky body having a leading end and a trailing end and being of generally uniform cross-sectional dimension, the improvement which comprises a thin flat tail extending from the trailing end of the bulky body, and at least one thin walled pocket to receive fish attractant located at a junction of the thin flat tail and the trailing end of the bulky body, whereby the thin flat tail flutters in use relative to the body and imparts corresponding movement to the pocket and its contents relative to the body to enhance the effectiveness of the fish attractant.

4,953,320
HEATED COCKROACH TRAP
Lawrence L. Nelson, 125 Royal Dr., Apt. 2408, Madison, Ala. 35758
Filed Sep. 15, 1989, Ser. No. 408,118
Int. Cl.[5] A01M *1/02*
U.S. Cl. 43—121 **20 Claims**



1. An insect trap comprising:

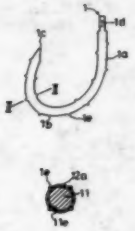
means defining a confined space;
means for attracting insects into said confined space; and
means for periodically heating said space at predetermined intervals to a temperature high to kill the insects attracted therein.

4,953,321

FISHHOOK AND PRODUCING METHOD OF THE SAME

Yoshikazu Furuta, 116, Takiro-cho 6-chome, Tajimi-shi, Gifu-ken, Japan

Filed Feb. 24, 1989, Ser. No. 314,800
Claims priority, application Japan, Feb. 3, 1989, 1-26059
Int. Cl.[5] A01K *83/00*
U.S. Cl. 43—43.16 3 Claims



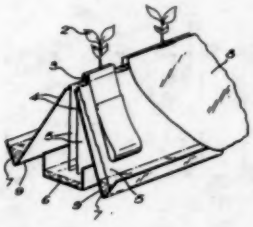
1. A fishhook comprising:
(a) a metallic base member having a fishhook-like shape provided with a shank, a bend and a point, and
(b) at least one film layer made of a hard metallic compound formed on said base member by chemical vapor deposition,
said metallic base member having a plurality of projections distributed over an entire surface of said base member thereby,
said fishhook having an uneven surface composed of said plurality of projections on which said at least one film layer is formed.

4,953,322

METHOD AND APPARATUS FOR HYDROPONIC CULTIVATION

Cyril K. Edwards, 6 Stoughton Close, Oadby, Leicestershire, England

Continuation of Ser. No. 7,997, Jan. 29, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 319,860
Claims priority, application United Kingdom, Feb. 4, 1986, 8602641
Int. Cl.[5] A01G *31/02*
U.S. Cl. 47—64 20 Claims



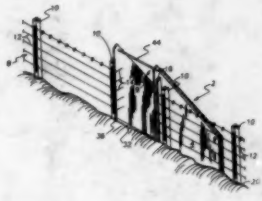
1. A method of growing a plant hydroponically which comprises applying a nutrient solution to the root of said plant and removing exudates which are carried from said root by a sheet of hydrophilic material, which is so disposed that it carries said nutrient solution by capillarity from a source thereof upward past said root situated above said source to a collecting area situated below the level of said source, and wherein said nutrient solution in the hydrophilic material, flows by capillarity in an upward direction against gravity extending from the root tip to the mature root of said plant and carries said exudates in the same direction.

4,953,323

ONE WAY ANIMAL GATE

Terry Quisenberry, 895 W. Kuiaha Rd., Maui, Hi. 96708

Filed Mar. 10, 1989, Ser. No. 321,695
Int. Cl.[5] E06B *9/52*
U.S. Cl. 49—58 29 Claims



1. An animal gating system, comprising:
obstruction means for separating a first location from a second location, and
a gate, connected to the obstruction means and extending through the obstruction means, the obstruction means for preventing the movement of animals between the first location and the second location except through the gate, the gate including:
a bottom having one way conveying means for conveying the animals along the bottom from the first location to the second location and for preventing the animals from returning to the second location through the gate, and
sides, each side having a bottom edge connected to the bottom of the gate, the sides being of trapezoidal shape, each trapezoidal side further including a front edge and a rear edge, the front edge of each side being longer than the rear edge of each side.

4,953,324

PERSONNEL DOOR FOR A RF SHIELDED ROOM

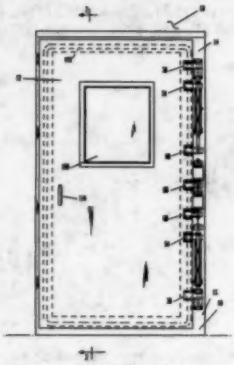
Karl H. Herrmann, Seattle, Wash., assignor to Nova-Tech Engineering, Inc., Edmonds, Wash.

Continuation of Ser. No. 129,490, Dec. 7, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 330,828
Int. Cl.[5] E05F *7/02*
U.S. Cl. 49—255 15 Claims

1. A sealing system to prevent RF radiation leakage into or from a room having an access aperture extending to the floor of the room comprising
a. a door leaf;
b. a floor;
c. an opening below floor level directly under said door leaf and outside of the access aperture;
d. a door frame having a top portion located at the borders of the access aperature, the door frame having a bottom portion disposed in said opening below floor level;
e. slidable hinging means attached to said door leaf and said door leaf and said door frame, said slidable hinging means allowing vertical movement of said door leaf relative to said door frame while allowing said door leaf to pivot relative to said door frame;
f. retaining means for retaining said door leaf in a first position above said opening below floor level when said door leaf is in a closed position relative to the access aperature;

g. energizing means for overcoming said retaining means and sliding said door leaf vertically relative to said door frame to a second position so as to partially dispose said door leaf in said opening below floor level and align the borders of said door leaf with the top and bottom portion of said door frame.

h. locking means which simultaneously locks said door leaf in a fixed position relative to said door frame as said door leaf is lowered to the second position partially disposed in



said opening below floor level, said locking means including top locking means which locks the top of said door leaf and said door frame, said locking means further including first side locking means for locking the side of said door leaf having said slidable hinge means, said first side locking means independent of said slidable hinge means, and includes pin means attached to said door frame and adapted to be received by first slot means attached to said door leaf.

4,953,325

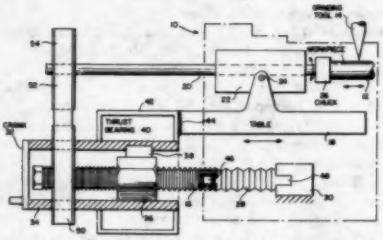
THREAD GRINDING ATTACHMENT

Edwin W. Unser, Williston Park, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 16, 1989, Ser. No. 366,956

Int. Cl.[5] B24B *3/00*

U.S. Cl. 51—95 TG **7 Claims**



1. An attachment for a cutting tool grinder machine which includes a translatable table and a shaft-driven chuck for securing a cylindrical work piece in contact with a grinding tool, the attachment comprising:

a fixed removable master thread member;

a sleeve coaxially mounted over the master thread member;

a nut mounted to the master thread member and keyed to the sleeve;

a crank connected to the sleeve for rotating the sleeve and the keyed nut;

means connected between the sleeve and the table for causing the translation of the latter upon turning of the crank at a rate corresponding to the pitch of the master thread member; and

means connected between the sleeve and a drive shaft of the machine for rotating the work piece while it translates to duplicate the thread of the master threaded member.

4,953,326

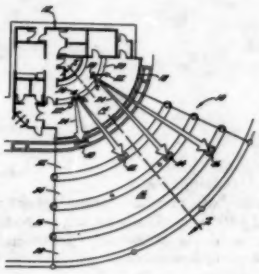
DRIVE-UP TELLER STATION

Stuart K. Wexler, Riverwoods; John E. Jones, Winnetka, and Paul A. Jones, Glenview, all of Ill., assignors to Glenview State Bank, Glenview, Ill.

Filed Mar. 16, 1989, Ser. No. 324,383

Int. Cl.[5] E04H *3/04*

U.S. Cl. 52—33 **29 Claims**



1. A drive-up customer service station, comprising:

a service counter and an area for employees located on one side of the service counter;

a drive-up window located on the opposite side of said service counter;

a walk-in customer area located between said service counter and said drive-up window; and

a drive-up customer area located on the opposite side of said drive-up window from said walk-in customer area.

4,953,327

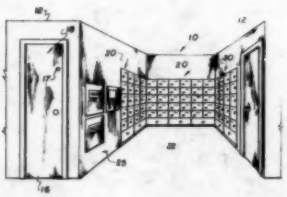
MINI-OFFICE FACILITY

Alija Cohodar, 495 NE. 83rd St., Miami, Fla. 33138

Filed Oct. 27, 1989, Ser. No. 427,499

Int. Cl.[5] A47B *81/00*

U.S. Cl. 52—36 **14 Claims**



1. A storage and receiving structure designed to define a mini-office facility, said structure comprising:

(a) a housing comprising a hollow interior defining at least one compartment defining a mini-office and including a front access opening,

(b) a separating partition extending from a front end of each of said compartments within said housing adjacent said front access opening to a rear end of said compartment,

(c) said separating partition disposed inwardly from side walls of said compartment and dimensioned and disposed to define, with said side walls, a primary portion and a secondary portion,

(d) said primary and secondary portions isolated from one another and both including a front end communicating with and accessible through said front access opening,

(e) a rear access opening formed in said housing in communicating, accessible relation with said secondary portion of said compartment and isolated from said primary portion,

(f) a front closure means disposed in covering and non-covering relation to said front access opening and said primary and secondary portions and a rear closure means disposed in covering and non-covering relation to said rear access opening and said secondary portion, and

(g) telephone and electrical utility outlet means mounted on an interior of said primary portion for providing telephone and electrical service to said primary portion,

(h) whereby a telephone and telephone answering/recording machine may be operatively maintained within said primary portion.

4,953,328

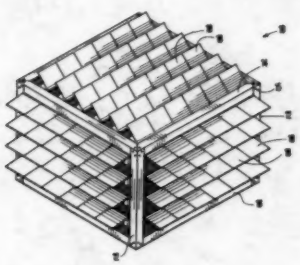
AIR CONDITIONING COMPRESSOR SECTIONALIZED COVER

Scott R. Sewell, 5041 20th Ave. North, St. Petersburg, Fla. 33710, and Diane Fleming, 74 Patti Ct., Franklin, Ohio 45005

Filed May 24, 1989, Ser. No. 356,174

Int. Cl.[5] E06B *7/092*

U.S. Cl. 52—79.1 **5 Claims**



1. An air conditioner compressor sectionalized cover, comprising:

a housing having four generally vertical corner posts;

each adjacent pair of said corner posts connected at a top end by a top rail and at a bottom end by a bottom rail, each pair of said top and bottom rails extending in generally horizontal parallel relation;

three generally vertical sidewalls and a horizontal ceiling of said housing formed by a plurality of rows of shutters, said housing having an open side;

each of said rows of shutters formed by a plurality of pairs of interconnected adjacent shutters;

each pair of adjacent shutters of each row joined by mating interlocking fasteners to allow said housing to be assembled in a variety of different dimensions for use with a variety of different sizes of external air compressor units;

means mounting each of said rows of shutters for movement between open and closed positions;

means for retaining each of said rows of shutters in said open position;

and

an open bottom end of said housing dimensioned for insertion over an external air compressor unit.

4,953,329

SINGLE-LAYER, POLYGONALLY-CURVED SUPPORTING FRAME STRUCTURE

Erich Franti, Laudongasse 33/76, A-1080 Wien, Austria

Filed Jul. 6, 1988, Ser. No. 215,490

Claims priority, application Austria, Jul. 8, 1987, 1724/87

Int. Cl.[5] E04B *1/32*

U.S. Cl. 52—81 **5 Claims**

1. A single-layer, polygonally-curved supporting frame structure having increased rigidity by means of prestressed tension members, said structure including a plurality of supporting bars which are connected to each other at bend points, a first set of tension members which members connect pairs of a first plurality of said bend points, and a second set of tension members which members each connect two bend points of a second plurality of said bend points, each two bend points of said second plurality thereof lying on opposite sides of each said bend point which is connected by a tension member of said first set, all of the tension members of said first and second sets being prestressed under tension whereby all of said supporting bars are under compression and the rigidity of the resulting frame structure is improved.

4,953,330

DAMPING DEVICE IN A STRUCTURE AND DAMPING CONSTRUCTION AND DAMPING METHOD USING THOSE DEVICES

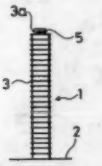
Toshiyuki Noji, Chiba; Hidetoshi Yoshida, Tokyo; Eiji Tatsumi, Chiba; Shinichi Akao, Saitama, and Hideyuki Kosaka, Chiba, all of Japan, assignors to Mitsui Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,496

Claims priority, application Japan, Dec. 1, 1987, 62-305379; Dec. 24, 1987, 62-327650; Mar. 22, 1988, 63-67950

Int. Cl.[5] E02D *27/34*

U.S. Cl. 52—167 DF **12 Claims**



1. A damping device for absorbing vibrations of a structure by providing said damping device on an upper portion of the structure, said damping device comprising:

an elongated vessel for containing a liquid therein such that movement of the vessel will create a wave motion of the liquid surface in the elongated direction of the vessel;

a plurality of damping means disposed inside said vessel for reducing the amplitude of a wave of the liquid in said vessel while substantially allowing the reduced amplitude wave to continue its wave motion; and

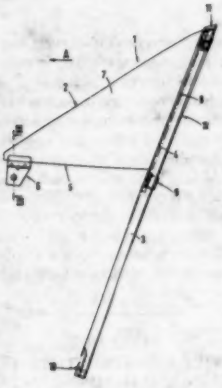
wave dissipation means for absorbing and dissipating waves

above a predetermined amplitude such that wave amplitude above said predetermined amplitude is absorbed and dissipated and prevented from reflecting and interfering with the wave motion cycle in said elongated vessel.

4,953,331
STATIONARY WINDOW ARRANGEMENT AT A MOTOR VEHICLE DOOR

Hermann Ziegler, Renningen; Horst Handte, Heimsheim; Walter Braun, Sindelfingen, and Horst Gutzeit, Wiernsheim, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,903
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1988, 3810146
Int. Cl.[5] E06B 3/00
U.S. Cl. 52—208 **6 Claims**



1. A stationary window arrangement of a motor vehicle door comprising a window having a rear edge which is connected with an upright extending holding web by the interposition of a seal means, said holding web having an upper end piece, a holding rail being mounted at the lower edge area of the window and spaced from the holding web and seal means, wherein the window, the holding rail, the seal means, the holding web and said upper end piece for the holding web are prefabricated to form a preassembled unit which is assembled in a single operation and which is able to be installed in the vehicle door by attachment of the holding web and rail to the vehicle door.

4,953,332
MASONRY STRUCTURE SYSTEM

Craig D. Galloway, 3509 West 5175 South, Roy, Utah 84067

Filed May 15, 1989, Ser. No. 352,026
Int. Cl.[5] E04C 3/10
U.S. Cl. 52—228 **7 Claims**

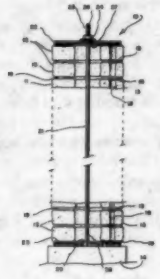
1. A masonry building system using conventional flat sided building units, said system comprising:

at least one series of at least two of said units arranged with facing pairs of flat sides;

a flat compressible non-metallic, non-masonry interface plate member placed between each of the pairs of facing sides of the units of the series unbonded thereto; and

a pair of plates, one bearing upon the outermost flat side of one end unit and the other upon the outermost flat side of the remaining end unit of the series; and

at least one tension member placed to act between the pair of plates to urge the units into forcible contact of their facing

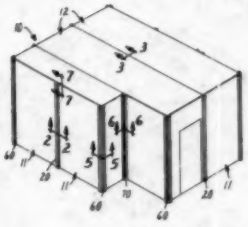


flat sides with the flat compressible interface plate member therebetween.

4,953,333
CLEAN ROOM ENCLOSURE

Bruce M. Carlson, P.O. Box 33427, St. Paul, Minn. 55133-3427

Filed Nov. 17, 1986, Ser. No. 931,615
Int. Cl.[5] E04B 1/00
U.S. Cl. 52—281 **10 Claims**



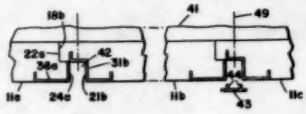
1. A clean room enclosure comprising a ceiling and side walls, said side walls comprising side wall panels fixedly attached to support studs such that at least a portion of said studs are exposed to said enclosure; said studs having a plurality of slots in the exposed surface thereof and disposed adjacent said panels, said slots containing flexible sealing members therein; a vertical trim member displaced over said exposed surfaces of said studs, said trim member comprising a flat plate having extended inwardly from at least the outboard edges thereof slotted members containing flexible sealing members therein; and, means for operatively attaching said trim member to said studs in a manner such that all sealing members effectively prevent passage of air therethrough, wherein said means for operatively attaching said trim members to said studs comprises substantially parallel channel members integral with said trim member and extending inwardly from said flat plate toward said stud, the ends of said channel members being tapered inwardly, and a threaded member threadedly attached to said support stud, the head of said threaded member being engaged by said ends of said channel members, such that said threaded member can rotatable increase the sealing force of said sealing members.

4,953,334

ECONOMY BUILDING PANEL

Luther I. Dickens, Radford, Va., assignor to RADVA Corporation, Radford, Va.

Filed Oct. 29, 1987, Ser. No. 114,048
Int. Cl.[5] E04C *1/00*
U.S. Cl. 52—309.4 6 Claims



1. An improved insulating building panel comprising an expanded cellular core with substantially parallel front and back faces,

said core having first and second side edges with complementary stepped configurations with a first edge having a wider step than the second edge, and

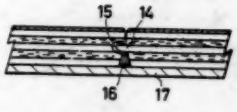
thin reinforcing strips bonded to the front face of said core adjacent said side edges with the strip on the first edge extending along the lateral step surface a distance substantially equal to the difference in width of said steps at said first and second edges.

4,953,335

DECORATIVE BOARD HAVING HOT-MELT RESIN JOINTS

Shiro Kawaguchi, and Katsunori Kai, both of Osaka, Japan, assignors to Eidai Industry Co., Ltd., Osaka, Japan

Filed Apr. 26, 1988, Ser. No. 186,379
Int. Cl.[5] E04B *5/00*
U.S. Cl. 52—384 4 Claims



1. A flooring board assembly comprising:

a plurality of board parts, each said board part having a front surface and a back surface, the back surfaces of the assembled said plurality of board parts being coated with a flexible sheet;

each said board part providing generally opposed tongue and groove formations thereon engagable with the groove and tongue formations, respectively, on an adjacent said board part of said assembly, each said board part being further formed with a first notched surface below said tongue formation thereon and a second notched surface below said groove formation thereon, the corresponding said first and second notched surfaces of any pair of adjacent said board parts forming a groove-like cavity upon engagement of the corresponding said tongue and groove formations thereof; response to upward or downward flexure, respectively, of one of the corresponding pair of engaged said board parts so as to conform said flooring board assembly to an uneven floor system; and

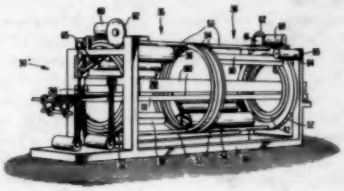
each said board part being further formed with a plurality of perpendicular grooves on the front surface thereof and a plurality of notches on the back surface thereof.

4,953,336

HIGH-TENSILE WRAPPING APPARATUS

Patrick R. Lancaster, III, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation of Ser. No. 186,649, Apr. 19, 1988, Pat. No. 4,866,909, which is a continuation of Ser. No. 804,542, Dec. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 582,779, Feb. 23, 1984, abandoned. This application Aug. 17, 1989, Ser. No. 395,041
The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.
Int. Cl.[5] B65B *13/12*
U.S. Cl. 53—556 4 Claims



1. An apparatus for stretch wrapping a bundle with a film web dispensed from a film web dispenser comprising:

a film web dispenser for dispensing a film web;

means for maintaining a substantially constant supply speed of the film web at the film web dispenser by preventing the supply speed of the film web at the film web dispenser from increasing and preventing the supply speed of the film web at the film web dispenser from decreasing;

an applicator mandrel having a noncircular cross-section;

means for revolving the film web dispenser relative to the applicator mandrel to wrap the film web onto the applicator mandrel;

means for moving a bundle through the applicator mandrel;

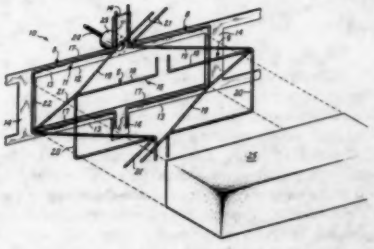
means for transferring the film web from the applicator mandrel onto the bundle so as to provide a containment force in the film web after it is applied onto the bundle.

4,953,337

METHOD AND APPARATUS FOR CONSTRUCTING A MASONRY STRUCTURE

Ronald L. Mills, 2338 Bolton Rd., N.W., Apt. 12, Atlanta, Ga. 30318

Filed Dec. 8, 1987, Ser. No. 130,015
Int. Cl.[5] E04F *13/08*
U.S. Cl. 52—385 7 Claims



1. A method of erecting a masonary structure adjacent a wall comprising the steps of:

laying a support foundation adjacent the base of the wall;

securing a level support bar to the foundation;

placing a jig defining a plurality of masonry unit accepting compartments adjacent the wall with the bottom portion of the jig resting on the support bar;

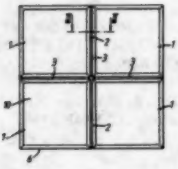
placing spacers between the jig and the wall;
placing attaching means through the jig and through the spacers;
securing the attaching means to the wall;
placing masonry units in the masonry unit accepting compartments with the masonry units defining spaces therebetween;
placing one end portion of a nozzle within the space between the masonry units a predetermined distance below the surface of the masonry units with the one end portion having a predetermined shape;
connecting the other end portion of the nozzle to a source of mortar under pressure;
actuating the flow of mortar under pressure through the nozzle and into the space between the masonry units;
moving the nozzle at a predetermined speed within the space between the masonry units in the direction of the space while maintaining the one end portion of the nozzle at the predetermined distance below the surface of the masonry units within the space whereby the space between the masonry units is filled with mortar and the exposed surface of the mortar is sculpted by the one end portion of the nozzle to a shape corresponding to the predetermined shape of the one end portion of the nozzle.

4,953,338

SCREEN ASSEMBLY

Mervyn Wilson, Kettering; Martin Gibbons, Weybridge, both of England, and Simon Perutz, Evanston, Ill., assignors to Nimlok Limited, England

Continuation of Ser. No. 76,489, Jul. 22, 1987, abandoned. This application Jun. 23, 1989, Ser. No. 370,605
Int. Cl.[5] A47B *5/00*
U.S. Cl. 52—586 **3 Claims**



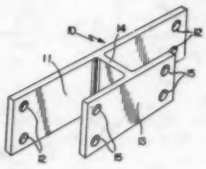
1. A portable display system comprising a plurality of removable display panels arranged in adjacent edge to edge relation; at least one elongate connecting member disposed between and interconnecting adjacent panels, each of said adjacent panels including a frame member provided with an outwardly facing elongate slot having an enlarged interior portion and a narrow exterior entrance communicating therewith, the connecting member having a pair of relatively spaced slot-engaging protuberances having enlarged heads sized to slidably fit within corresponding slot interior portions and narrow neck segments slidably disposed within corresponding narrow entrances, and a body portion interconnecting said protuberances; at least one of the adjacent interconnected display panels including a fastening element having a foot portion securable in the frame member slot, and a supporting portion for mounting an external device on at least the one adjacent panel.

4,953,339

DECK BRACKET FOR OF ATTACHING A DECK TO A BUILDING

Ricky S. Jewell, RFD #2, P.O. Box 4985, Mechanic Falls, Me. 04256

Division of Ser. No. 139,968, Dec. 31, 1987, Pat. No. 4,811,542. This application Jan. 24, 1989, Ser. No. 301,322
Int. Cl.[5] E04C *3/30*
U.S. Cl. 52—729 **3 Claims**



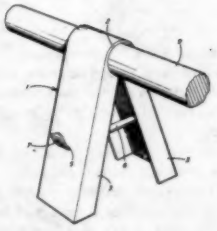
1. A deck bracket for mounting a deck horizontally to a building comprising a wide flange, said wide flange having openings at its ends adapted to mount said wide flange to a building therethrough, a narrow flange, said narrow flange having openings at its ends adapted to mount said narrow flange to a deck therethrough, a web, said web intermediate of said flanges, and said wide flange and said narrow flange being integral and spaced apart by said web.

4,953,340

BAR SUPPORT FOR CONCRETE

Howard A. Anderson, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 16, 1989, Ser. No. 366,986
Int. Cl.[5] E04C *5/07*
U.S. Cl. 52—684 **6 Claims**



1. As an article of manufacture, a chair for maintaining and supporting a cylindrical, horizontally extending, reinforcing rod in a fixed position in connection with a concrete installation said chair comprising a thermoplastically molded or extruded channel having two side walls running along its long dimension, each of said walls having a section cut therefrom, said channel being sufficiently elastic to enable its bending across its long dimension to attain a shape enabling the embrace within said section, the at least partial circumferential cross-section of said reinforcing rod, said chair further containing means to secure said channel in said shape.

4,953,341

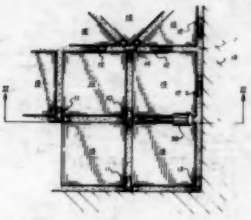
SPACERS FOR LAYING TILE AND METHOD OF USE

Bob Joos, 760 E. 12000 S., Draper, Utah 84020

Filed Aug. 14, 1989, Ser. No. 393,236

Int. Cl.[5] E04G *21/16*

U.S. Cl. 52—747 9 Claims



1. A method of laying tiles to maintain uniform spacing between rows and columns of the tiles, said method comprising

spreading an adhesive material on a substrate to which said tiles are to be applied;

placing said tiles in columns and rows on the substrate and in contact with said adhesive;

placing spacer elements into said adhesive material between the edges of adjacent tiles as the tiles are laid, said spacer elements consisting of a plurality of legs extending radially from a common juncture, each of said legs having a top surface, bottom surface, and an end surface, each of said bottom surfaces lying entirely in a single plane, at least one of said legs of each spacer element having a beveled edge which extends partially above the level of the adhesive material when the spacer is positioned between the edges of adjacent tiles in contact with the adhesive;

allowing the adhesive to set and firmly adhere the laid tiles and the spacer elements to the substrate;

applying a tool to the beveled edge of said at least one leg of the spacer elements to lift the spacer away from said adhesive and said tiles to form substantially open channels between the adjacent tiles; and

filling the channels between the tiles with a grout.

4,953,342

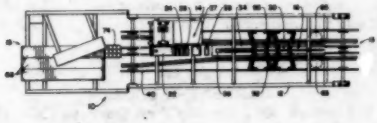
MULTI PACKAGE CONTAINERS

Charles M. Hynes, 10116 Shiller Blvd., Franklin Park, Ill. 60131

Division of Ser. No. 394,200, Jul. 1, 1982, abandoned. This application May 9, 1988, Ser. No. 193,199

Int. Cl.[5] B65B *27/04, 35/44*

U.S. Cl. 53—398 4 Claims



1. A method of creating a multi-package for cans, or the like, including the steps of;

arraying a plurality of containers in rank and row configuration and assembling a primary package making device on a series of selected numbers of containers to create a series of sub-packages so that the containers in each sub-package so created are firmly arrayed and contained relative to one another,

arranging a continuous roll of serially separable secondary packaging bands adjacent the sub-packages,

positioning the separable bands loosely over a set of jaws which includes at least four jaws arranged so they form corners of an imaginary rectangle,

moving the jaws linearly away from a longitudinal center line of the bands in a direction outwardly and at an angle to perpendicular from the center line, to open and slightly stretch the band without substantial movement of the jaws relative to the bands,

moving the jaws and stretched band combination continuously over a continuously moving stream of sub-packages on a conveyor,

the movement of the jaws, with stretched bands, being both longitudinally relative to the movement of the containers and downwardly onto telescopic association over the arrayed sub-packages.

4,953,343

MACHINE FOR PACKAGING FLAT, UNSYMMETRICAL OBJECTS

Stig Hellman, Vällingby, Sweden, assignor to Akerlund & Rausing Licens Aktiebolag, Jarfalla, Sweden

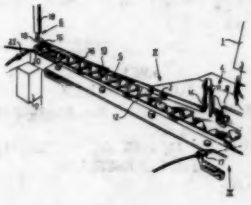
PCT No. PCT/SE88/00136, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/07471, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 18, 1988, Ser. No. 278,440

Claims priority, application Sweden, Mar. 26, 1987, 8701268

Int. Cl.[5] B65B *35/44, 35/56, 57/20, 65/08*

U.S. Cl. 53—500 11 Claims



1. Apparatus for packaging non-rotation-symmetrical objects with an exact preselected number of objects in each package, each object having at least one flat side on which the object is advanced, said apparatus comprising an object storage unit (1), a transport unit (3, 4, 5) for advancing objects received from the object storage unit (1) and having means (11, 13) for preventing objects from becoming jammed as the objects are advanced, a counting unit (22) for counting objects advanced by the transport unit (3, 4, 5), and a discharge unit (23, 24) for releasing a preselected number of objects advanced by the transport unit, characterized in that the transport unit (3, 4, 5) has means for preventing objects from being advanced one above another or on edge, the transport unit includes a front transport trough partially defined by opposing sidewalls and slopping toward one side, said sidewalls converging toward an output end having a width slightly larger than the largest dimension of an object to be packaged, said sidewalls including a fixed lower sidewall (12) and a resiliently yieldable upper sidewall (13), said upper sidewall (13) being outwardly yieldable when acted upon by objects in said trough.

4,953,344

PACKAGING FIBRE BATTS

Keith Wallace, Corunna, Canada, assignor to Fiberglas Canada Inc., Canada

Filed May 20, 1987, Ser. No. 52,724

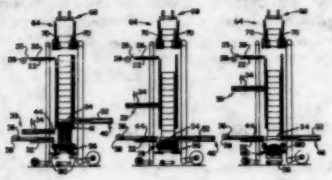
Claims priority, application United Kingdom, Jun. 6, 1986, 8613760

Int. Cl.[5] B65B *1/24;* B30B *15/06*

U.S. Cl. 53—528 15 Claims

1. In an apparatus for packaging batts of glass fiber material

having a width W and which are adapted to be compressible and elastic in one direction but not in two directions perpendicular to said one direction, the apparatus comprising a pair of compression members, means for effecting relative displacement of said compression members to compress a stack of said batts therebetween and means for providing a covering around the compressed stack to retain said batts in a compressed state, the improvement comprising opposed concave surfaces on said compression members for forming correspondingly convex



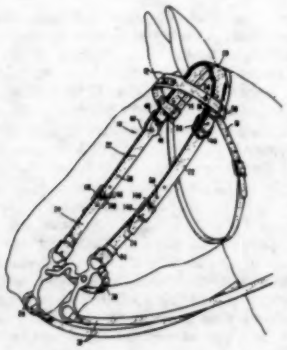
surfaces at opposite ends of said stack during the compression thereof, said correspondingly convex surfaces being at least substantially similar in shape to corresponding convex upper and lower surfaces of said covering around the compressed stack, said concave surfaces being curved surfaces having a radius of curvature of between about W/2 and about 3W, thereby facilitating compression of the stack counteracting damage to said batts during the compression thereof and promoting satisfactory recovery of said batts upon release from said covering.

4,953,345

HORSE BRIDLE

Raymond N. Boone, New Haven, Ky., assignor to Leatherhead Shop, Inc., Louisville, Ky.

Filed Jul. 21, 1988, Ser. No. 222,711
Int. Cl.[5] B68B *1/04*
U.S. Cl. 54—6 R **11 Claims**



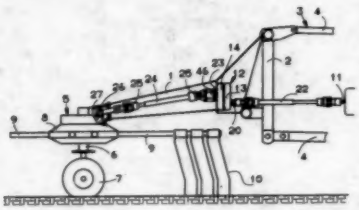
1. A horse bridle comprising;
a crown having opposite ends;
a pair of cheek straps each of which is attached to an opposite end of said crown;
attachment means for attaching said pair of cheek straps to opposite sides of a bit;
a spare crown having opposite ends removably attached to said pair of cheek straps
wherein said spare crown is designed and arranged to be removed from said pair of cheek straps to serve as a replacement for said crown or either of said pair of cheek straps.

4,953,346

TRACTOR DRIVEN FARM MACHINE

Jerome Aron, Bouxwiller, France, assignor to Kuhn S.A., Saverne, France

Filed May 22, 1989, Ser. No. 354,832
Claims priority, application Japan, May 26, 1988, 88 07194
Int. Cl.[5] A01D *69/06*
U.S. Cl. 56—11.1 **12 Claims**



1. A farm machine having tool means to be rotatably driven by a power takeoff shaft of a tractor, comprising:
a frame connectable to the tractor;
rotatably drivable tool means mounted relative to said frame; and
means for transmitting rotational drive from said power takeoff to said tool means, comprising:
(a) a transmission housing mounted to said frame,
(b) first and second drive shafts journalled to said housing,
(c) first and second meshing gears positioned in said housing and respectively mounted on said first and second drive shafts, said first and second gears having different diameters and a different number of teeth,
(d) an input shaft having one end connectable to the power takeoff shaft of the tractor and another end selectively connectable to portions of one of said first and second drive shafts located outside of said transmission housing,
(e) a third gear rotatably held in said housing by a driven shaft,
(f) transmission means for drivingly connecting said driven shaft to said tool means, and
(g) means for selectively meshing said third gear with one of said first and second gears, wherein said means for selectively meshing comprises eccentric means for journalling said driven shaft to said housing and means for rotating said eccentric means such that said third gear moves between said first and second gears when said eccentric means is rotated,
whereby said tool means may be driven at a desired rotational speed by connecting said input shaft to a selected one of said drive shafts, and whereby said tool means may be rotatable driven in a desired direction by meshing said third gear with one of said first and second gears.

4,953,347

GARDENING TOOL

Todd R. Siegfried, 405 Lyoncross Way, San Jose, Calif. 95123

Filed Apr. 21, 1989, Ser. No. 341,782
Int. Cl.[5] A01B *1/16*; A01D *7/00*
U.S. Cl. 56—400.12 **7 Claims**

1. An apparatus for picking up and compressing low density matter comprising:
a. a first member and a second member, each of said members comprising:
(1) a substantially rectangular blade having a face and a back, the blade including a plurality of folds dividing blade into planar sections including two end sections and at least one central section forming a concave surface,

(2) a cylindrical handle having a grippable end opposite from an attaching end, and

(3) means for attaching said attaching end of said handle to the central section of said blade, said folds being perpendicular to said handel

b. rotatable means for attaching said handle from said first member to said handle from said second member, said

blade from said first member being maintained in a face to face relationship with said blade of said second member so that the concave surface of the first member is juxtaposed to the concave member of the second member, said attaching means forming a pivot allowing said blades to be brought together or separated by moving said members relative to one another in a scissor-like manner.

4,953,348

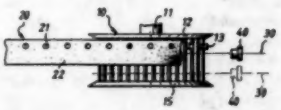
SYNCHRONOUS YARN FEEDING DEVICE

Jen F. Chen, P.O. Box 1-79, Taipei, Taiwan 10602

Continuation of Ser. No. 216,959, Jul. 11, 1988, abandoned. This application Oct. 23, 1989, Ser. No. 425,392

Int. Cl.[5] D01H *13/14*

U.S. Cl. 57—85 **15 Claims**



1. A yarn feeding device for use in a textile machine, said textile machine including a machine body and a frame fixed on said body, said yarn feeding device comprising:

a drum rotatably mounted on said frame;

a yarn guiding means movably mounted beside said drum on said frame;

an endless driving belt provided to engage said drum at the outer circumference thereof;

a yarn being fed by said belt on said drum; wherein

said drum includes an outer periphery with a first portion having a first rigid projecting engaging means for engaging a corresponding portion of said driving belt, a second drum portion adjacent said first drum portion for receiving a portion of yarn being fed onto said drum when said drum is engaged with a corresponding portion of said driving belt, and a third drum portion for receiving a portion of yarn being fed off said drum when said yarn guiding means is operatively moved toward said third portion of said drum;

said driving belt includes a first belt portion having a second engaging means for cooperative engagement with said first drum portion and said first engaging means, and a second belt portion having a substantial major portion adjacent said first belt portion for pressing a portion of yarn against said drum second portion as a portion of yarn is fed onto said drum; and wherein

said first engaging means provided on said drum and said second engaging means provided on said driving belt are cooperatively interlocked with each other to maintain the position of said belt second portion relative to said drum second portion in an axial direction with respect to said drum so as to effectively prevent said belt from an axial movement; and

said yarn guiding means is operatively controlled to guide movement of said yarn only in the region between said second drum portion and said third drum portion;

whereby when said yarn guiding means is operatively moved to guide said yarn toward said second portion of said belt and said drum, said yarn will be pressed between and driven by the inner surface of said second belt portion and the outer surface of said second drum portion in synchronism with said driving belt and the rotation of said drum so that a substantially constant and uniform yarn feeding operation is provided; and when said yarn guiding means is operatively moved to guide said yarn from said second portion to said third portion of said drum, said yarn is not driven by said driving belt.

4,953,349

APPARATUS FOR MAKING A YARN

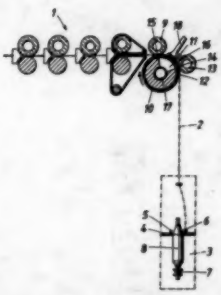
Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

Filed Sep. 6, 1989, Ser. No. 403,706

Claims priority, application Austria, Sep. 29, 1988, 2403/88; Nov. 29, 1988, 2928/88; Dec. 23, 1988, 3142/88

Int. Cl.[5] D01H *5/18, 5/32, 5/70, 5/74*

U.S. Cl. 57—315 **2 Claims**



1. In an apparatus for making a yarn, comprising

ring spinning means,

drawing means defining at least one draft path and operable to draw at least one roving along said at least one draft path, said drawing means also comprising delivery roller means defining at least one clamping nip and operable to deliver at least one drawn roving from said at least one draft path through said at least one clamping nip to said ring spinning means,

said delivery roller means comprising a deflecting delivery roller, which has a peripheral surface portion that extends from said at least one clamping nip to a delivery end remote from said at least one clamping nip,

said apparatus further comprising means for contacting said at least one drawn roving with said peripheral surface portion from said at least one clamping nip to said delivery end so that said peripheral surface portion constitutes a guiding surface for deflecting said drawn roving on said deflecting delivery roller,

the improvement residing in that

said peripheral surface portion is formed with a slideway, which adjoins said delivery end and is arranged to guide

said at least one drawn roving on said peripheral surface portion transversely to the axis of said drawn roving,

at least one pressure-applying roller is provided to urge said at least one drawn roving against said peripheral surface portion at a distance from said delivery end,

said peripheral surface portion is provided between said at least one clamping nip and said pressure-applying roller with at least one suction zone having two mutually opposite longitudinal sides extending in the peripheral direction of said delivery roller, and

blasting means are provided, which are laterally outwardly spaced from at least one of said longitudinal sides of said at least one suction zone and are operable to discharge against said peripheral surface portion an air blast so that said air blast flows on said peripheral surface portion toward said suction zone transversely to said peripheral direction.

4,953,350

FUNNEL FOR A FUNNEL SPINNING APPARATUS ON A TEXTILE MACHINE

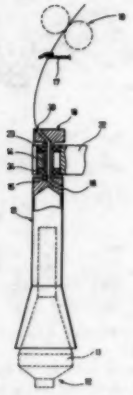
Günter Schulz, Ebersbach/Fils; Frieder Probst, Eislingen, and Hermann Güttler, Uhingen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 19, 1989, Ser. No. 340,382

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3812267

Int. Cl.[5] D01H *7/00, 7/26, 7/66, 13/04*

U.S. Cl. 57—354 **9 Claims**



1. A yarn feeding funnel for use in a textile machine of the type in which yarn is wound on a bobbin and which has a bearing for rotatably supporting the yarn feeding funnel in yarn guiding relation to the bobbin, comprising:

an upper shaft portion having a yarn inlet opening and a yarn passage extending from said inlet opening for passage of yarn through said upper shaft portion, said upper shaft portion being rotatably supportable above the bobbin by the bearing for rotation about an axis and said inlet opening being radially offset from said axis; and

a body portion extending downwardly from said upper shaft portion and having a yarn passage extending from said yarn passage in said upper shaft portion to an outlet opening for passage of yarn traveling from said upper shaft portion through said body portion to the outside of said funnel for feeding to the bobbin.

4,953,351

COMBUSTION CONTROL

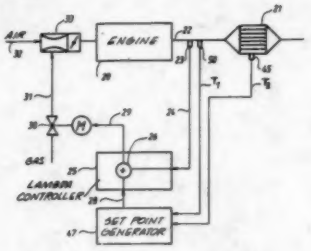
Karl Motz, Bergkirchen-Eisolzried, and Markus Diehl, Furstenfeldbruck, both of Fed. Rep. of Germany, assignors to Man Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 14, 1988, Ser. No. 270,087

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738454; Jul. 2, 1988, 3822415

Int. Cl.[5] F02D *41/14*

U.S. Cl. 60—285 **9 Claims**



1. A method of automatically controlling the air/fuel ratio of an IC engine having a catalyst, comprising

producing a signal representative of air/fuel ratio of a combusted mixture by a lambda probe which samples exhaust gas from an IC engine upstream of the catalyst,

measuring exhaust gas temperatures both upstream of the catalyst and after the exhaust gas has passed through at least a portion of the catalyst,

determining in a lambda controller on the basis of the measured exhaust gas temperatures and the air/fuel ratio signal from the lambda probe a set point for controlling the air/fuel ratio of the engine,

maintaining the engine at a constant load condition while the set point is determined,

said determining of said set point being effected by

varying the air/fuel ratio of the engine in steps which causes variation in the value of the exhaust gas temperature after the exhaust gas has traveled through at least a portion of said catalyst and

establishing the value of the set point for an air/fuel ratio at which the temperature of the exhaust gas after passing through at least a portion of the catalyst is in a maximum temperature range.

4,953,352

EXHAUST SYSTEM

Monty A. Campbell, 4989 Holt Blvd., Montclair, Calif. 91763

Continuation-in-part of Ser. No. 107,870, Oct. 8, 1987, Pat. No. 4,800,719, which is a continuation of Ser. No. 769,995, Aug. 26, 1985, abandoned, which is a continuation of Ser. No. 461,863, Jan. 28, 1983, abandoned. This application Jan. 31, 1989, Ser. No. 304,239

Int. Cl.[5] F02B *27/02*

U.S. Cl. 60—313 **11 Claims**

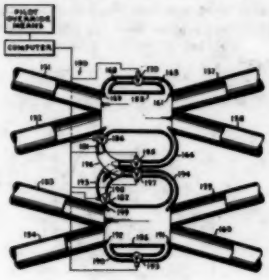
1. An exhaust system for an internal combustion engine having at least four exhaust ports and having an exhaust pipe flow connected to each port; said system comprising:

(a) at least two chambers;

(b) said exhaust pipes in pairs and each pair being flow connected opposite the end thereof adapted to be connected to said exhaust ports at one of said chambers; and

(c) a duct flow connecting two of said chambers; said duct

including flow directing means for directing a minor portion of a feedback emission flow passing through a first



of said chambers such that said minor portion flows into a second of said chambers through said duct.

4,953,353

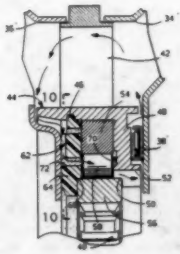
ROLLER CLUTCH FOR STATOR ASSEMBLY

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1989, Ser. No. 397,211

Int. Cl.[5] F16D *33/00*

U.S. Cl. 60—345 **2 Claims**



1. A torque converter stator assembly, comprising,

a stator having a central cylindrical hub with an end wall and a retention groove,

a pair of clutch races disposed coaxially within said hub with a predetermined radial spacing therebetween,

an integrally molded cage unit including a front race retention wall,

said cage unit retention wall having a flexible retention means engageable with said retention groove to prevent said races from moving away from said end wall within said hub,

said cage unit retention wall further having an evenly spaced plurality of windows arrayed in a circle and opening axially therethrough into said radial space, said windows having a radial width less than said predetermined radial spacing,

said cage unit further including a plurality of journal blocks extending axially inwardly from said retention wall between said windows, said journal blocks having a redial thickness approximately equal to said predetermined radial spacing,

said cage unit further including a circular end ring disposed parallel to and axially spaced from said retention wall and integral with said journal blocks so as to form a plurality of pockets, said end ring further occupying only radial space unoccupied by said windows, so that said cage unit may be bypass molded, and,

a roller and energizing spring located in each of said pockets, whereby, said cage unit, rollers and springs may be installed as a subassembly between said races, after which said windows provide direct visual access to said rollers and springs.

4,953,354

THERMALLY INSULATED STIRLING ENGINE-HOT GAS HEATER SYSTEM COMBINATION

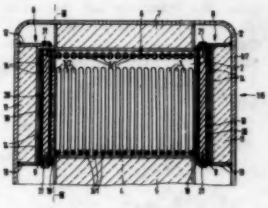
Anton Erber, Mühlhausen; Heinz Hoff, Königsbrunn; Günter Reuchlein, Augsburg; Hanno Schaaf, Friedberg, and Gerhard Schiessl, Augsburg, all of Fed. Rep. of Germany, assignors to MAN Technologie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 10, 1988, Ser. No. 269,639

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739926; Feb. 26, 1988, 3806114

Int. Cl.[5] F02G *1/04*

U.S. Cl. 60—517 **20 Claims**



1. The combination of a hot gas engine (1) with a hot gas heating system (1/6),

said combination, at least in part, having

an outer wall (1/7) surrounding the hot gas heating system (1/6) and an inner, heat insulating lining therefore,

wherein said heat insulating lining includes

an inner insulating wall (9), spaced from the outer wall (1/7), said insulating wall (9) comprising

a plurality of replaceably retained insulating elements (14, 19, 24) of ceramic material; and

ceramic heat insulating material (11) including at least one of: batts, and loose lump material filling the space between the outer wall (1/7) and said replaceably retained insulating elements forming the inner wall (9).

4,953,355

STEAM TURBINE INSTALLATION WITH ADJUSTED BLEEDING

Jean Poulain, Lamorlaye, and Jacques Desdoulits, Chaville, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Aug. 14, 1989, Ser. No. 393,209

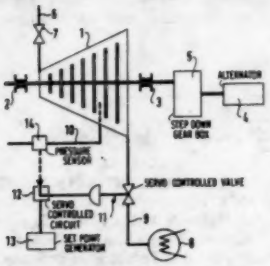
Claims priority, application France, Aug. 16, 1988, 88 10921

Int. Cl.[5] F01K *13/02*

U.S. Cl. 60—663 **3 Claims**

1. In a steam turbine installation provided with means including a bleed line for bleeding the turbine installation to adjust the pressure in the bleed line to a predetermined pressure P, the installation driving a load and including a bleed outlet disposed between two successive stages and opening to said bleed line, the improvement comprising an exhaust duct, and a servo valve disposed on the exhaust duct and controlled

by a servo-control circuit including means for measuring the pressure of the bleed flow within said bleed line for adjusting



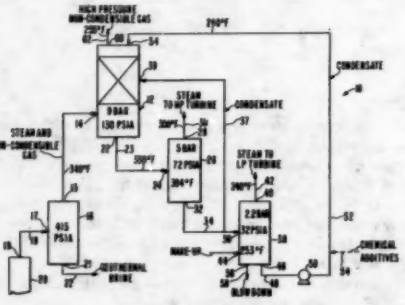
the servo valve disposed on the exhaust duct to adjust the bleed pressure P over a range D of bleed rates.

4,953,356

GEOTHERMAL REBOILER APPARATUS AND METHOD

Randall Soo-Hoo, San Francisco, and August D. Benz, Hillsborough, both of Calif., assignors to Bechtel Group, Inc., San Francisco, Calif.

Filed May 1, 1989, Ser. No. 345,917
Int. Cl.[5] F05G *7/00*
U.S. Cl. 60—641.5 **12 Claims**



1. Apparatus for handling a geothermal brine capable of being flashed to form a vapor fraction containing steam and a non-condensible gas comprising:

a direct contact reboiler;

means coupled with the reboiler for directing the vapor fraction of flashed geothermal brine into the reboiler;

a first flash chamber;

means coupling the reboiler with the first flash chamber to allow a heated condensate from the reboiler to flow to said first flash chamber whereby the condensate will flash in the first flash chamber to produce clean steam which can be used for driving a first work-producing device;

a second flash chamber;

a first fluid line coupling the first flash chamber with the second flash chamber to allow the second flash chamber to receive condensate from the first flash chamber, whereby the condensate flashed in a second chamber can be turned into pure steam for use in operating a second work-producing device, there being a second fluid line coupled to said first fluid line for directing a portion of the condensate from the first flash chamber to the reboiler; and

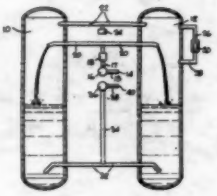
means for coupling the second flash chamber to the reboiler for directing condensate from the second flash chamber to the reboiler.

4,953,357

SAFETY REFRIGERANT STORAGE CYLINDER

Leon R. Van Steenburgh, 1900 S. Quince, Denver, Colo. 80231

Continuation-in-part of Ser. No. 258,166, Oct. 14, 1988, which is a continuation-in-part of Ser. No. 109,958, Oct. 19, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 297,054
Int. Cl.[5] F17C *1/00*
U.S. Cl. 62—45.1 **12 Claims**



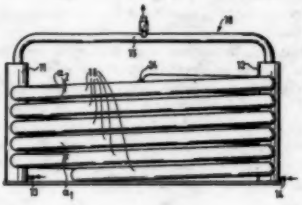
1. An apparatus for storing refrigerant comprising, holding means for holding refrigerant within the apparatus, and float control means for preventing access to said holding means when a certain predetermined maximum level is contained within said holding means, said float control means comprised of valve means for controlling access to said holding means and switch means located outside of said holding means for detecting when said predetermined maximum level has been attained.

4,953,358

COOLING DEVICE FOR LIQUEFIED GAS

Paul Grohmann, Maria-Enzersdorf, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,194
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 3809290
Int. Cl.[5] F17C *13/00*
U.S. Cl. 62—50.7 **17 Claims**



1. In a cooling device to cool a liquefied gas having a low boiling point, the improvement being first and second containers which are connected to each other by means of vacuum-insulated cooling-line segments having an inner and outer conduit wherein liquified gas continuously flows from said first container to the second container in one direction and cooling gas continuously flows in the outer conduit from said second container to the first container in counter current heat transfer thereto.

4,953,359

METHOD OF ADAPTING A TWO-STAGE REFRIGERATOR CRYOPUMP TO A SPECIFIC GAS

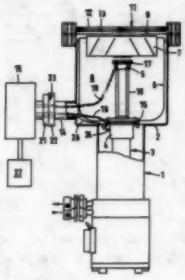
Hans-Joachim Forth, and Hans-Ulrich Häfner, both of Köln, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Köln, Fed. Rep. of Germany

Filed Apr. 14, 1989, Ser. No. 338,606

Claims priority, application European Pat. Off., Apr. 22, 1988, 88106497

Int. Cl.[5] B01D *8/00*

U.S. Cl. 62—55.5 11 Claims



1. Method of adapting a two-stage refrigerator cryopump to a specific gas which has a given vapor temperature corresponding to a vapor pressure curve for the specific gas at a maximum process pressure; the cryopump including a first cooling stage to which first pump surfaces are fastened; the cryopump further including a second cooling stage to which second pump surfaces are fastened and which, during operation, takes on a temperature of up to 20 degrees K., comprising the steps of:

providing a heating device for heating said first cooling stage;

controlling said heating device such that the coldest location of said first cooling stage has a temperature which is higher by 5 degrees K. to 10 degrees K. than said vapor temperature of said specific gas associated with said maximum process pressure.

4,953,360

ADDITIVE FOR TREATING WATER USED TO FORM ICE

Michael J. Rzechula, Elizabethtown, Ill., assignor to Slick Ice Limited, Elizabethtown, Ill.

Filed Sep. 27, 1989, Ser. No. 411,117

Int. Cl.[5] E01H *4/02*

U.S. Cl. 62—66 28 Claims

21. A solution composition for use in forming ice, comprising:

1 part by volume of an additive comprising about 50.0 to 77.0% by volume of an alcohol-based surfactant, about 9.9 to 27.0% by volume of a silicone oil emulsion, and about 10.0 to 30.0% by volume of ethyl alcohol; and

no more than 1370 parts by volume of water.

4,953,361

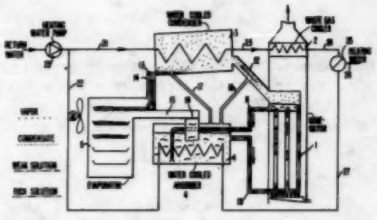
PROCESS FOR THE OPERATION OF A GENERATOR ABSORPTION HEAT PUMP HEATING INSTALLATION FOR SPACE HEATING, WATER HEATING, ETC. AND GENERATOR ABSORPTION HEAT PUMP HEATING INSTALLATION

Karl F. Knoche, Schinkelstrasse 8, D-5100 Aachen; Dieter Stehmeier, Schlossweiherstr. 14, and Heinz-Bernd Grabenhenrich, Lütticher Str. 320, both of 5100 Aachen, all of Fed. Rep. of Germany

Continuation of Ser. No. 242,128, Sep. 9, 1988, abandoned, which is a continuation of Ser. No. 130,659, Dec. 4, 1987, abandoned, which is a continuation of Ser. No. 9,668, Feb. 2, 1987, abandoned, which is a continuation of Ser. No. 776,881, Sep. 17, 1985, abandoned. This application Jul. 26, 1989, Ser. No. 385,156

Int. Cl.[5] F25B *7/00*

U.S. Cl. 62—79 24 Claims



1. Process for an operation of a generator absorption heat pump heating installation for wherein heating energy to the supplied to a heating liquid to be heated flowing back from the heating system can be supplied both by high temperature heat taken from a directly heated generator means and from low temperature heat absorbed by an absorption heat pump means, the method comprising the steps of: operating the absorption heat pump means with a periodic change of operating phases including a generation phase with condensation and an evaporation phase with absorption at different pressure levels, supplying, in the generation phase, high temperature heat through the generator means to a working substance solution circuit and supplying useful heat during the condensation phase of resulting vapor of a condenser to the heating liquid, supplying, during the absorption phase, the high temperature heat to the coolant in an evaporator means and as useful heat in an absorber means to the heating liquid, and automatically alternately switching both high and low temperature heat supply on when a heating liquid return or supply temperature drops below a predetermined lower temperature limit and off when the hot liquid return or supply temperature rises above a predetermined upper temperature limit.

4,953,362

REFRIGERATOR-FREEZER UNIT

Takeuchi Shoji, Gunma; Iino Katsuyoshi, and Takahashi Ryoichi, both of Maebashi, all of Japan, assignors to Sanden Corporation, Japan

Filed Jul. 10, 1989, Ser. No. 377,252

Claims priority, application Japan, Jul. 8, 1988, 63-90597[U]; Jul. 8, 1988, 63-90598[U]

Int. Cl.[5] A47F *3/04*

U.S. Cl. 62—246 15 Claims

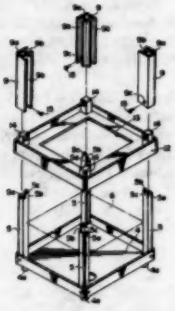
1. A refrigerator-freezer unit comprising:

a lower machine room for a refrigerator;

an upper cold room for cooling goods and positioned generally above said lower machine room;

vertical machine room pillars associated with said lower machine room, said machine room pillars having machine room pillar top portions;

vertical cold room pillars associated with said upper cold room, said cold room pillars having cold room pillar bottom portions substantially connected to said machine room pillar top portions; and



a frame disposed between said machine room and said cold room, said frame having a plurality of fitting means onto which both said machine room pillars top portions and said cold room pillar bottom portions are fitted.

4,953,363

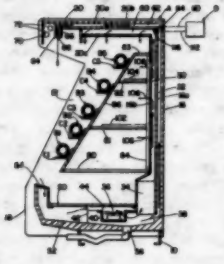
FLORAL DISPLAY CASE

Randolph J. Primozic, Willoughby Hills, Ohio, assignor to Floraline Display Products Corp., Willoughby, Ohio

Filed Dec. 13, 1989, Ser. No. 450,174

Int. Cl.[5] A47F *3/04*

U.S. Cl. 62—255 **33 Claims**



22. A display case for cut flowers, said case having a back wall, an open front and an overhead portion, a plurality of elongated tubular manifolds extending substantially horizontally and parallel to one another and being spaced-apart in upwardly terraced relationship from said open front toward said back wall, each said manifold having a plurality of spaced-apart upwardly facing openings therein for receiving and supporting stem portions of cut flower bouquets which are viewable and physically accessible through said open front of said case, said overhead portion being spaced above and overlying said manifolds, refrigerated air supply means for supplying a cascade of refrigerated air through said overhead portion for decent upon said manifolds, air curtain supply means for supplying a narrow curtain of air through said overhead portion for descent along said open front of said case, and air stabilizing means extending between said back wall and said manifolds for stabilizing the mixture and movement of air in the space between said back wall and said manifolds.

4,953,364

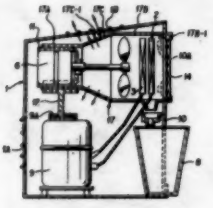
SUCTION GUIDE DEVICE FOR DEHUMIDIFIER

Shin H. Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Jul. 5, 1989, Ser. No. 375,627

Int. Cl.[5] F25D *21/14*

U.S. Cl. 62—285 **28 Claims**



21. A suction guide device for installation within the outer enclosure of an air conditioning apparatus, comprising: a unitary inner enclosure in the shape of a hopper, said inner enclosure having an extended section with an air inlet and adapted to house an evaporator adjacent said air inlet and a condenser adjacent said evaporator; an insertion section for housing a suction means for directing a flow of air through said unitary inner enclosure; a central tapered section formed between said insertion section and said extended section, said central tapered section having an air outlet; and a supporter means for connecting said insertion section of said enclosure to said outer enclosure and for absorbing vibrations of said unitary inner enclosure.

4,953,365

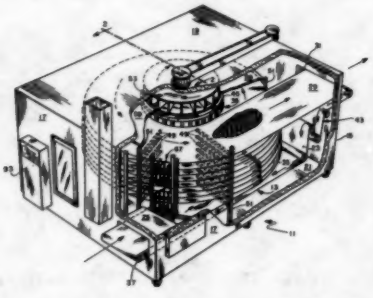
HELICAL CONVEYOR FREEZER

Gary D. Lang, Naperville; Donald S. Finan, Chicago, and George D. Rhoades, La Grange, all of Ill., assignors to Liquid Carbonic Corporation, Chicago, Ill.

Filed Jun. 28, 1989, Ser. No. 373,056

Int. Cl.[5] F25D *25/02*

U.S. Cl. 62—381 **25 Claims**



1. A cryogenic food freezer comprising

a thermally insulated enclosure,

a cage located within said enclosure mounted for rotation above a vertical axis, said cage being of generally circular cross-section and having a generally open sidewall formed of a plurality of generally vertically extending members,

means for rotating said cage about its vertical axis,

an endless flexible conveyor belt within said enclosure and disposed helically about said cage in engagement along its inner edge with said cage, said belt also having loading and unloading sections,

said enclosure having entrance means and exit means through which food products being frozen can be introduced and removed,

blower means in communication with one axial end of said cage for circulating gas within said enclosure to withdraw heat from food products being frozen, said blower means being located to such gas from the interior of said cage and means at the other axial end of said cage preventing gas flow therethrough toward said blower means, so that high pressure gas is directed into a region generally between the interior wall of said enclosure and said helically disposed belt, from which a generally radially inward gas flow is created across the food products being carried on said helical belt, and

refrigeration means for cooling the gas within said enclosure to a temperature of about −30° F. or below, said refrigeration means comprising cryogen injection means positioned to inject liquid cryogen radially inward so that said injection cryogen impinges upon food products carried on and positioned across the width of said helical belt aided by said radially inward concurrent gas flow and also cools the gas.

4,953,366

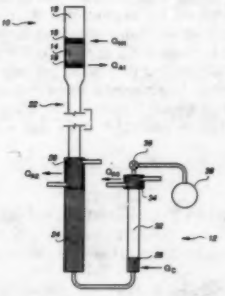
ACOUSTIC CRYOCOOLER

Gregory W. Swift, Santa Fe; Richard A. Martin, Los Alamos, both of N. Mex., and Ray Radebaugh, Louisville, Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1989, Ser. No. 412,712

Int. Cl.[5] F25B *1/00*

U.S. Cl. 62—467 **18 Claims**



1. A thermoacoustic cryocooler having no moving parts, comprising:

a pulse tube refrigerator including a pulse tube, a first heat exchanger adjacent said pulse tube for inputting heat from a thermal load, and second heat exchanger for removing heat transferred from said first heat exchanger across said pulse tube;

said pulse tube being responsive to a fluid driving frequency for moving heat from said first heat exchanger to a higher temperature at said second heat exchanger;

a thermoacoustic prime mover for generating a standing acoustic wave at said fluid driving frequency and at a pressure amplitude effective to drive said pulse tube for obtaining a selected temperature at said first heat exchanger; and

a standing wave tube supporting said standing wave and defining an antinode adjacent said pulse tube refrigerator.

4,953,367

SYSTEM FOR CONTROLLING SUPPLY OF YARN TO A YARN UTILIZATION APPARATUS, PARTICULARLY MULTI-FEED CIRCULAR KNITTING MACHINE

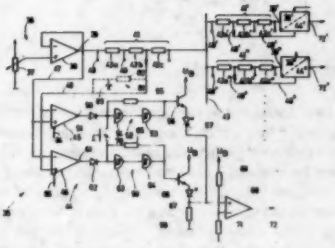
Gustav Memminger, Freudenstadt; Heinz Fabschitz, Westerham, and Falk Kühn, Rottenburg, all of Fed. Rep. of Germany, assignors to Memminger Iro GmbH, Freudenstadt, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 380,145

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1988, 3824034

Int. Cl.[5] D04B *15/38*; B65H *59/38*

U.S. Cl. 66—132 R **32 Claims**



1. System for controlling supply of yarn (12) to a yarn utilization apparatus, particularly a multi-feed circular knitting machine having

a plurality or yarn supply means (1);

a plurality of yarn utilization stations, receiving the yarn from the yarn supply means;

a plurality of sensing means (21, 22) coupled to the yarn (12) running between the yarn supply means and the utilization stations and providing yarn supply parameter signals;

a plurality of measuring circuits (36 . . . 36″) coupled to receive the yarn parameter signals and having output terminals (39 . . . 39″) for delivering output signals which have a characteristic of the parameter of the yarn during supply of the yarn (12) from the yarn supply means to the utilization station,

and comprising, in accordance with the invention

reference signal generating means (38, 41 . . . 41″. 43) coupled to a predetermined plurality of the measuring circuits for generating a reference signal,

which reference signal is dependent on all the output signals from said predetermined plurality of measuring circuits (36 . . . 36″);

a deviation signal generating circuit (44—44″) associated with each of the yarn supply means and coupled to receive

(a) the reference signal; and

(b) the output signals from the measuring circuit associated with the respective yarn supply means,

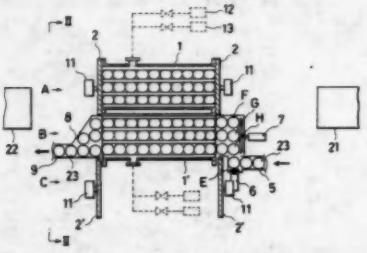
and generating respective deviation signals if the output signals applied to the deviation signal generating circuit, and the reference signals representative of the respective parameters of the predetermined plurality of measuring circuits, differ by a predetermined value.

4,953,368

METHOD OF AND APPARATUS FOR HEAT-TREATING BOBBINS OF YARN

Takuya Kawasaki, Takarazuka, and Osamu Kawakami, Amagasaki, both of Japan, assignors to Nikku Industry Co., Ltd., Itami, Japan

Filed Feb. 17, 1988, Ser. No. 156,789
Claims priority, application Japan, May 1, 1987, 62-106360; Jul. 17, 1987, 62-177162
Int. Cl.[5] D06B 3/09
U.S. Cl. 18—5 C 7 Claims



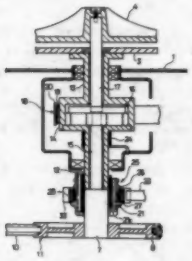
1. A heat treatment apparatus for bobbins of yarn installed on a conveyor line which connects a spinning machine and a winding machine together, the heat treatment apparatus, comprising: a hermetically enclosed container means being in a hermetically-sealed state for performing a series of heat treatment operations therein such as a vacuum process and a steam-heating process; a heat treatment container being in a non-hermetically-sealed state for allowing a series of upright bobbins of yarn to be supplied into the heat treatment apparatus from one side and discharged from the other side; a vacuum pump means for evacuating the hermetically enclosed container means; and a transfer means for moving the hermetically enclosed container means to the non-hermetically-sealed state, and the heat treatment container to the hermetically-sealed state, each of said bobbins having a non-perforated tube for taking up said yarn.

4,953,369

WASHING MACHINE

Michiaki Ito, Seto, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 23, 1989, Ser. No. 397,954
Claims priority, application Japan, Aug. 26, 1988, 63-213049; Nov. 25, 1988, 63-299200
Int. Cl.[5] D06F 37/40
U.S. Cl. 68—23.7 8 Claims



1. A washing machine comprising:

(a) a rotating tub provided with a hollow tub shaft extended from the outer bottom thereof;

(b) a drive shaft disposed so as to be axially adjacent to an extended end of the tub shaft;

(c) an agitator shaft directly coupled with the drive shaft so as to be rotated therewith and inserted in the tub shaft;

(d) an agitator mounted within the rotating tub so as to be rotated by the agitator shaft;

(e) an electric motor provided for driving the drive and agitator shafts;

(f) a clutch spring formed into a coil shape and wound about the outer peripheries of the tub and drive shafts so as to be tightly wound up about the tub shaft, the clutch spring being wound up with rotation of the drive shaft to thereby transmit rotation of the drive shaft to the tub shaft, the clutch spring having two ends;

(g) an inner cylindrical member disposed so as to enclose the clutch spring and having an engagement portion engaging one end of the clutch spring at the drive shaft side;

(h) an outer cylindrical member having a plurality of engagement claws formed on the outer periphery thereof, the inner cylindrical member being fitted within the outer cylindrical member so as to be rotatable with a predetermined frictional resistance against the outer cylindrical member;

(i) a clutch lever engaging any one of the engagement claws of the outer cylindrical member to thereby prevent a wind-up action of the clutch spring such that rotation of the drive shaft is prevented from being transmitted to the tub shaft, the clutch lever being disengaged from the engagement claw of the outer cylindrical member to thereby allow the clutch spring to be wound up such that rotation of the drive shaft is transmitted to the tub shaft;

(j) a brake mechanism applying a braking force to the tub shaft when said any one of the engagement claws is engaged with the clutch lever and releasing the braking force from the tub shaft when the engagement claw is disengaged from the clutch lever; and

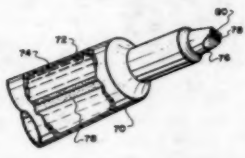
(k) a stopper provided in the inner cylindrical member, the stopper including an edge against which the other end of the clutch spring strikes when the clutch spring is loosened a predetermined amount in a rotative movement of the clutch spring in the direction that the same is loosened, against the braking force applied to the tub shaft by the brake mechanism and thereafter, causing the inner cylindrical member to rotatively move relative to the outer cylindrical member against the frictional resistance thereof with movement of said other end of the clutch spring.

4,953,370

HANDICRAFT FOR PRODUCING SIMULATED NEEDLEPOINT

Perry N. Hambright, 23515 Oxnard St., Woodland Hills, Calif. 91367

Filed Sep. 5, 1989, Ser. No. 403,164
Int. Cl.[5] D06B 11/12
U.S. Cl. 68—213 3 Claims



1. In combination with a textile, said textile being formed of a plurality of yarn loops located in a closely spaced array, a color marking instrument for transferring a particular color of dye onto a single said yarn loop, said color marking instrument comprising:

a casing adapted to be grasped by the hand of a human being, said casing being hollow forming an internal chamber, said internal chamber to function as a reservoir for a quantity of a dye, said casing having a tip, said tip terminating in an outer edge, said tip having an opening, the transverse size of said opening being slightly larger than the transverse cross-sectional size of each said yarn loop with all said yarn loops having substantially the same cross-sectional size;

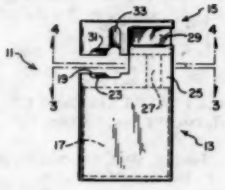
a wick mounted within said opening, a portion of said wick extending into said reservoir and another portion of said wick being mounted within said opening, said portion of said wick within said opening being spaced inwardly of said outer edge becoming a recessed marking nib, whereby a said loop must enter said opening to contact said to wick to pick up the color of the dye from said reservoir which has impregnated said wick.

4,953,371

SHACKLELESS PADLOCK

Paul Appelbaum, 2125 S. Ammons St., Lakewood, Colo. 80227

Filed Dec. 11, 1989, Ser. No. 448,219
Int. Cl.[5] F05B *67/36*
U.S. Cl. 70—32 **3 Claims**



1. Improved padlock for securing a latching member, comprising:

(a) main case having a bottom, spaced-apart side walls and an upper wall with at least one shaft-receiving bore therein, said walls enclosing a locking mechanism, and including portions of said side walls that extend upwardly beyond said case upper wall and that surround said at least one bore, and said upper wall having an upper face providing a first shaped portion for engaging a latching member;

(b) latching head, disposed above said main case, and having at least one shaft-like connecting member fixedly attached to said head and extending from the bottom of said head into said at least one bore to make lockable engagement and limited axial movement therein, said head having outer wall portions that are slidably embraced within said upwardly extending side wall portions of said case for guiding said head in vertical movement relative to said case and for shielding said at least one shaft-like connecting member, and said latching head having a lower face providing a second shaped portion for engaging a latching member;

(c) wherein said padlock has a locked position in which said at least one shaft-like member is locked within said case and said first shaped portion lies in close proximity to said second shaped portion, and said latching head being releasable to an open position in which said first and second shaped portions are spaced apart wherein said first shaped portion is contoured with a first arcuate groove, and a second arcuate groove lies in said second shaped portion, and said first and second grooves adapted to grasp and hold a U-shaped member when said padlock is in locked position, and

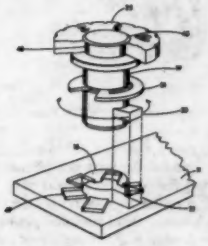
a third arcuate groove in said second shaped portion, and wherein when said padlock is in locked position, said first, second and third grooves are adapted to grasp and hold a U-shaped member in a first orientation with respect to said padlock in which said first and second arcuate grooves grasp said U-shaped member, or in a second orientation at about 90° to said first orientation in which said third arcuate groove grasps said U-shaped member.

4,953,372

INEXPENSIVE KEYLESS USER CUSTOM CODED LOCK

Walter C. Lovell, 348 Mountain Rd., Wilbraham, Mass. 01095, and Robert L. Nathans, 36 Stag Dr., Billerica, Mass. 01821

Filed Sep. 22, 1988, Ser. No. 247,675
Int. Cl.[5] E05B *65/00*
U.S. Cl. 70—89 **14 Claims**



1. A method of enabling user customization of a combination code of a lock comprising the steps of:

(a) providing a lock for preventing relative movement between a first component and a second component including;

(a-1) first and second anchor means to be fastened to said first and second component respectively, said second anchor means including an apertured member having an upper portion and a lower portion, together with aperture means formed therethrough, and a movable cover plate means;

(a-2) cover plate coupling means for coupling said cover plate means to said first anchor means;

(a-3) a plurality of individually rotatable coding elements extending through said cover plate means and said aperture means and each having an angular position indicating element coupled thereto via a slip coupling means, and each rotatable coding element having a blocking member coupled thereto and positioned beneath the lower portion of said apertured member when said lock is locked, and wherein said aperture means includes a passageway associated with each of said rotatable coding elements for permitting each of said blocking members to completely pass through an associated passageway upon the proper angular settings of each of said rotatable coding elements required to open said lock;

(b) positioning said cover plate means with respect to said second anchor means for causing said blocking members to co-act with said second anchor means to prevent rotation of said rotatable coding elements;

(c) selectively rotating each angular position indicating element, in accordance with a user created combination code, relative to an associated coding element by virtue of said slip coupling and a reaction torque produced by each blocking member co-acting with said second anchor means, while maintaining said cover plate means in the position set forth in paragraph (b);

(d) lowering said cover plate means to position each blocking member beneath said apertured member of said second anchor means; and

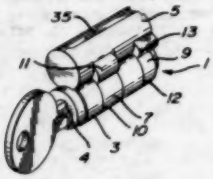
(e) rotating each angular position indicating element causing each blocking member to be displaced from its associated passageway to lock said lock.

4,953,373

KEY REMOVABLE CORE BODY

Abraham Toledano, Laval, Canada, assignor to Ilco Unican Inc., Montreal, Canada

Filed May 9, 1989, Ser. No. 349,573
Int. Cl.[5] E05B 27/00
U.S. Cl. 70—369 5 Claims



1. A key removable core body for insertion into a surrounding housing, comprising:

a plug housing and a tumbler pin housing, the cross-section of said core body defining a peripheral profile;

a plug supported for rotation in said plug housing;

a plurality of tumbler pin bores extending through said tumbler pin housing, said tumbler pin bores being configured in a predetermined arrangement along the length of said tumbler pin housing;

a like plurality of tumbler pin bores extending into said plug, and being configured in the same arrangement as said predetermined arrangement, along the length of said plug;

whereby, said tumbler pin bores of said tumbler pin housing can be aligned with said tumbler pin bores of said plug;

at least two separate control elements comprising a part of said plug housing, each of said control elements comprising a retainer lug, said retainer lug being movable between a retracted position, when each said retainer lug is substantially completely within said profile, and an extended position when each said retainer lug projects laterally of said core body outside of said profile;

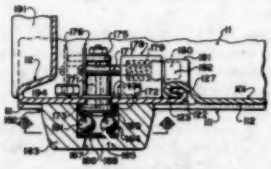
whereby, when all of said control elements are in their extended position, said core body is restrained from removal thereof from said surrounding housing.

4,953,374

SECURE LOCKING MECHANISM

Jacob R. Wiebe, 60 Heaton Avenue, Winnipeg, Manitoba, Canada R3B 3E3

Continuation of Ser. No. 126,899, Nov. 30, 1987, abandoned, which is a division of Ser. No. 944,746, Dec. 22, 1986, Pat. No. 4,732,317. This application Oct. 10, 1989, Ser. No. 419,008
Int. Cl.[5] E05B 17/00
U.S. Cl. 70—416 9 Claims



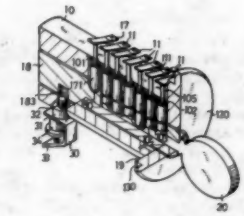
1. A lock mechanism comprising a lock actuating device, a lock member engageable by an elongate blade of a key, said lock member having a slot-shaped front opening for movement along an axis into the lock member of the blade of the key when pressed through said front opening, said key blade being shaped to have one dimension transverse to its length longer than a dimension at right angles thereto so that it can pass through the slot-shaped front opening, said member and key being arranged such that a matching key can be rotated to move the lock actuating device, and a security cover device for covering the front opening, said security cover device comprising a collar member surrounding said front opening and defining a cover opening forward of and axially aligned with said front opening, a cylindrical wall extending from said cover opening to said front opening, and lip means on said cylindrical wall at said cover opening, said cylindrical wall having a circular cylindrical inner surface surrounding said axis, a front plate member received within the cylindrical wall generally at right angles to the axis and free to rotate within the cylindrical wall about the axis, said front plate member having a slot-shaped opening therein for the key, said lip means confining the front plate member within the cylindrical wall against axial movement out of the cylinder a back plate member received within the cylinder generally parallel to the front plate member and free to rotate within cover device, and at least three rigid spherical balls separately and freely mounted in an area defined rearwardly of the front plate and inwardly of the cylindrical surface, each ball being free to move radially within the confines of the cylindrical surface, to rotate around said axis and to rotate around its own center, the balls being dimensioned relative to the cylindrical surface such that, when the balls are moved in an outward direction to a parted position sufficient to just allow the blade of the key to pass through a slot shaped opening closely defined between the balls, the balls are restrained from further movement in the outward direction by contacting the cylindrical surface.

4,953,375

ELECTRONICALLY SELF-LATCHING CYLINDER LOCK

Kae M. Tzou, 3 Fl., No. 181, Sec. 5, Chung Hsiao E. Rd., Taipei, Taiwan

Filed Feb. 16, 1990, Ser. No. 480,858
Int. Cl.[5] E05B 17/00
U.S. Cl. 70—441 2 Claims



1. An electronically self-latching cylinder lock comprising a cylinder into which a plug with a key way is inserted, a plurality of pin tumblers each of which is disposed in one of a plurality of bores formed inside said cylinder and said plug and extending to said key way, a plurality of switches associated with said pin tumblers, a latching means, a warning means, and an electronic circuit which is controlled by said switches to drive said latch means and said warning means, and characterized in that:

each of said switches is constituted by a spike, which is fixed on an associated pin tumbler of said pin tumblers and protrudes out of said cylinder, and a resilient conductor which is fixed to said cylinder via an insulator so that when said spike is caused to move upwards by said associated pin tumbler, said spike will contact said resilient conductor to form a closed electric loop;

said cylinder lock further comprises a control pin which has an associated switch including a spike fixed on said pin and a resilient conductor fixed on said cylinder via an insulator and which is disposed inside a bore formed inside said cylinder with the lower end thereof contacting a slot

formed on the surface of said plug so that when said plug is rotated, said slot will be inclined and said pin will be driven to have said spike thereof contact said resilient conductor;

said latching means comprises a latch disposed on a seat which is made of ferromagnetic material and a solenoid which is connected to said electronic circuit so that when said solenoid is energized by said electronic circuit, said seat will be moved and drive said latch into a hole formed on said plug to prevent said plug from being rotated; and

said electronic circuit includes a battery set, a plurality of switches each of which is connected to one of said switches associated with said pin tumblers, a further switch which is connected to said switch associated with said control pin, an integration circuit which is used to provide a time delay to the actuation of said latching means and said warning means, a triggering circuit which controls the actuation of said warning means and said latching means via a relay, and a battery testing circuit which sends out warning signals via said warning means when the voltage level of said battery set drops to be lower than a prespecified value,

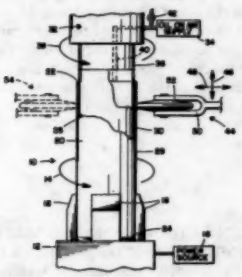
said electronic circuit being so connected that when an incorrect key is inserted into said key way, said triggering circuit will actuate said relay after a time interval controlled by said integration circuit, said relay then turning on said warning means and said solenoid so as to move said latch into said hole to prevent said plug from being rotated, and when a correct key is inserted into said key way, besides said switches associated with said pin tumblers, said switch associated with said control pin is also closed and said triggering circuit, together with said latching means and said warning means, is disabled.

4,953,376

METAL SPINNING PROCESS AND APPARATUS AND PRODUCT MADE THEREBY

John C. Merlone, 50 Old Hill Rd., Hamden, Conn. 06514

Filed May 9, 1989, Ser. No. 349,217
Int. Cl.[5] B21D *17/04*
U.S. Cl. 72—57 **42 Claims**



1. A process for forming a surface configuration on a metal container body comprising the steps of:

providing a metal container body having an open end, a closed end and generally cylindrical inner and outer surfaces;

inserting a resilient pressure means through said open end of said container body and into contact with said inner surface thereof;

rotating said container body and said resilient pressure means together around their longitudinal axes;

providing a metal forming tool with a forming portion thereon spaced from said outer surface of said container;

providing relative movement between said forming portion of said metal forming tool and said rotating container body so said forming portion engages and deforms said container to produce a desired shape thereon and deforms said resilient pressure means therein; and

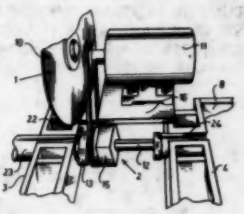
removing said resilient pressure means through open end of said container body.

4,953,377

METHOD AND APPARATUS FOR CUTTING AND DEBURRING TUBES

Lennart Thorell, Boxholm, Sweden, assignor to Boxholm Produktion AB, Boxholm, Sweden

PCT No. PCT/SE87/00616, § 371 Date May 30, 1989, § 102(e) Date May 30, 1989, PCT Pub. No. WO88/04589, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 18, 1987, Ser. No. 360,894
Claims priority, application Sweden, Dec. 19, 1986, 86055027
Int. Cl.[5] B21D *19/02*
U.S. Cl. 72—70 **9 Claims**



1. A method for cutting a stationary nonrotating base tube (23) successively into several smaller tube pieces (24) with adjacent cut ends between pieces being directly subjected to a subsequent metal working such a deburring in a machine that includes an input end, a cutting means (1), an actuable double acting movable metal working means (2), fixed and movable carrier jaws (3, 4), each having an opening through which said base tube can pass and be releasably clamped, said movable jaw (4) being axially movable along said base tube in relation to said fixed jaw (3) and having a tube stop, comprising the following steps:

A. moving said movable jaw to an initial position in spaced adjacent relation to said fixed jaw;

B. introducing said base tube (23) from the input end of the machine through fixed jaw (3) and into contact with said stop of said movable jaw (4);

C. closing said jaws (3, 4) to clamp and hold said base tube in said stationary nonrotating position;

D. moving said cutting means (1) down to a cutting position in said space (23) between said fixed and movable jaws (3, 4) and cutting said base tube at a predetermined position in relation to the fixed and movable jaws to create a front end on said base tube and a cutoff tube piece (24) having a rear end adjacent said front end of said base tube;

E. moving only said movable jaw (4) together with said cutoff tube piece (24) still clamped therein, axially a predetermined distance away from said fixed jaw (3) to create a work space and maintaining said base tube (23) and said cutoff tube piece (24) in coaxial relation with respect to each other while moving said cutting means (1) out of said cutting position;

F. moving said double acting metal working means (2) into said work space between said front end of said base tube (23) and said rear end of said cutoff tube piece (24);

G. actuating said metal working means (2) and at the same time moving only said movable jaw (4) axially to place said rear end of the cutoff tube piece into contact with said metal working means (2), and continuing axial movement of only said movable jaw while said tube piece rear end is in contact with said metal working means to force said metal working means to move axially into contact with

said front end of said base tube (23) to cause both of said front and rear tube ends to be concurrently worked by the metal working means;

H. removing said metal working means from said work space; and

I. unclamping said fixed and movable jaws (3, 4, removing said cutoff tube piece (24), and returning said movable jaw to said initial position for commencement of a new cycle of operation.

4,953,378

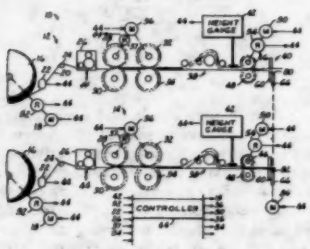
APPARATUS FOR CUTTING CORRUGATED STRIP STOCK AT VARIABLE LENGTHS

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Filed Jan. 13, 1989, Ser. No. 296,681

Int. Cl.[5] B21D *53/02*

U.S. Cl. 72—185 43 Claims



1. In a machine for corrugating a continuous length of strip stock that includes means for feeding a continuous length of strip stock in a continuous uninterrupted motion, opposed corrugation roller means positioned to receive strip stock therebetween from said feeding means for forming corrugations in said stock, means for cutting said corrugated stock into individual stock lengths, and apparatus positioned to receive corrugated stock from said roller means in said continuous uninterrupted motion for periodically arresting motion of the stock and for controlling lengths of stock severed by said cutting means comprising:

a measurement roller having teeth positioned to engage corrugations in said corrugated stock between said roller means and said cutting means,

means responsive to rotation of said measurement roller for measuring running length of corrugated stock fed to said cutting means,

a motor coupled to said measurement roller for selectively driving corrugated stock engaged by said roller toward said cutting means,

means responsive to said measuring means for simultaneously energizing said cutting means and de-energizing said motor when said running length equals a predetermined length so as to arrest motion of said corrugated stock when said cutting means is activated, and

slack take-up means positioned between said roller means and said measurement gear for taking up slack in said corrugated stock fed through said roller means in said continuous uninterrupted motion while motion of said corrugated stock is arrested at said measurement roller.

4,953,379

HOT-ROLLED STEEL BAR WITH HELICALLY EXTENDING RIBS, METHOD OF AND APPARATUS FOR PRODUCING THE STEEL BAR

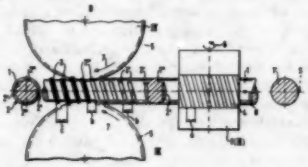
Erich Richartz, Grafing B. Munich, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft

Filed Oct. 25, 1988, Ser. No. 262,454

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3736942

Int. Cl.[5] B21H *3/00*

U.S. Cl. 72—187 5 Claims



1. A method of producing an axially elongated threaded steel bar, such as a concrete reinforcing bar, from a steel bar with a circular cross section comprising the steps of producing a continuous uninterrupted thread in a hot rolling operation, wherein initially hot rolling first ribs on a partial circumferential region on opposite sides of a bar with the ribs spaced apart in the circumferential direction and extending along a helical line, and immediately following formation of the first ribs hot-rolling second ribs extending along the helical line between and interconnecting the first ribs on opposite sides of the bar for providing a continuous helically extending thread made up of the first and second ribs, the hot rolling of the first and second ribs immediately follows the hot rolling of the steel bar and utilizes the rolling heat, the first ribs are formed in a first roll stand and the second ribs are formed in a second roll stand and a first axial spacing of the ribs formed in the first roll stand is less than a second axial spacing of the ribs in the second roll stand with the difference in spacing produced by the amount of extension of the steel bar in passing through the first roll stand to the second roll stand, and the second spacing is less than a final spacing of the ribs after exiting from the second roll stand by the amount of the extension of the steel bar due to its passage through the second roll stand, feeding the circular steel bar for forming the first ribs and shaping the circular steel bar so that it has an oval shape after the formation of the first ribs, and reshaping the steel bar in forming the second ribs so that the steel bar has a circular cross section after the formation of the second ribs with the first and second ribs forming the continuous thread.

4,953,380

DEVICE FOR GUIDING ROLLING MATERIAL IN A ROLLING MILL STAND OF A STRUCTURAL MILL

Alexander Svagr, Hilden, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 29, 1989, Ser. No. 373,800

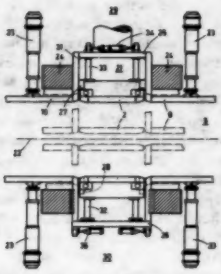
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821929

Int. Cl.[5] B21B *39/14*

U.S. Cl. 72—250 10 Claims

1. A device for guiding rolling stock in a flange edging roll stand of a shape steel rolling mill, the roll stand being within a reversing tandem group including a first universal stand, an edging stand and a second universal stand, the device comprising lateral flange guides 6 constructed of three parts including a center flange guide piece arranged in an area of a stand window 21 of the roll stand 3 or in an area of roll chocks 17, 18 arranged in the stand window 21, respectively, so as to be exchangeable and displaceable, and two outer flange guide

elements 9, 10 arranged on a side of the stand, and further comprising hydraulically actuable adjusting means 23 connected with the outer flange guide elements 9, 10 of a flange



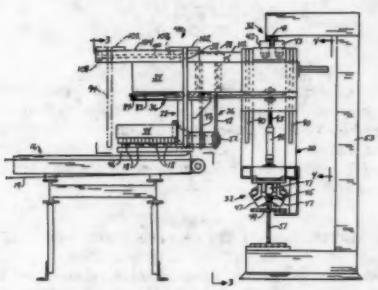
guide on the stand side, the outer flange guide elements 9, 10 being lockable with a respective flange guide piece 8 so as to form a guide surface.

4,953,381

EXTRUSION PULLER WITH STRIPPER FINGER

James T. Visser, Ada, Mich., assignor to Granco Clark, Inc, Belding, Mich.

Filed Nov. 16, 1989, Ser. No. 438,574
Int. Cl.[5] B21C *35/02*
U.S. Cl. 72—257 12 Claims



1. An extrusion pulling apparatus comprising:

an extrusion run-out table, having a longitudinal axis and a cooling table adjacent to the longitudinal axis;

an extrusion puller having a support frame, an upper jaw which is mounted for reciprocal vertical movement between clamping and release positions on the support frame, and a lower jaw which is mounted for reciprocal lateral movement between clamping and release positions on the support frame;

means mounting said puller for movement along the run-out table between a loading position and a release position to pull the work along the longitudinal axis as the extrusion puller moves between the loading and release positions;

the improvement which comprises:

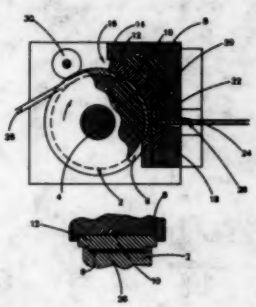
means on the extrusion puller for pushing the work laterally toward the cooling table and from the longitudinal axis when the puller reaches the release position along the run-out table.

4,953,382

EXTRUSION OF STRIP MATERIAL

Sankaranarayanan Ashok, Bethany; Harvey P. Cheskis, North Haven, and Eugene Shapiro, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 8, 1989, Ser. No. 447,762
Int. Cl.[5] B21C *23/01, 25/02*
U.S. Cl. 72—262 8 Claims



1. A process for forming metal shapes having a substantially larger width than height in cross section, said process comprising:

a. feeding material in elongated strip form into one end of a passageway formed between a first member and a second member, said strip having a substantially larger width than height in cross section, said first member having a greater surface area for engaging said metal than said second member, said passageway having a closed end remote from said one end and having die means adjacent said closed end, said die means having an opening of predetermined configuration which has a greater overall width than height, and

b. moving said first member relative to said second member in a direction toward said die means from said one end to said closed end so that the frictional drag of the passageway defining surface of the first member draws the metal through the passageway and through the die means.

4,953,383

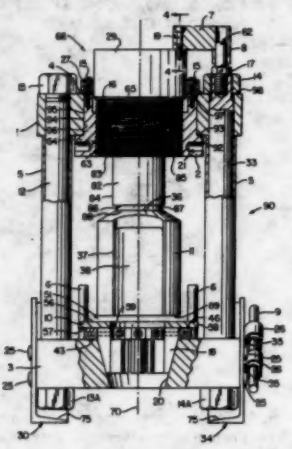
CRIMPING DEVICE, ADJUSTING RING THEREFOR

C. Edward Stiver; George J. Teti, both of Ocala, Fla.; Charles S. Pearson, Waynesville, N.C., and Kenneth R. Brown, Silver Springs, Fla., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 150,263, Jan. 29, 1988, Pat. No. 4,862,725.
This application Jun. 14, 1989, Ser. No. 366,083
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] B21D *41/04, 39/04*
U.S. Cl. 72—402 20 Claims

1. In a device for crimping a coupling to an end of a hose, said device comprising support means, die means carried by said support means for holding said hose end and said coupling, and crimping means carried by said support means and spaced apart from said die means a certain distance and in axial alignment therewith and comprising a cylinder member having a stop means and a piston member carried by said cylinder member adapted to be moved axially relative to said cylinder member into engagement with said die means to axially move said die means therewith until a part of said piston member abuts said stop means, the improvement comprising adjusting means carried by said support means and being operatively interconnected to said cylinder member of said crimping means for adjusting the entire axial position of said crimping means relative to said die means to change said certain distance to a new certain distance whereby when said piston member of said

crimping means is moved into engagement with said stop means said coupling is crimped to said hose end by said die means in accordance with a predetermined relationship that is determined by said new certain distance, said adjusting means comprising a calibration ring means, said calibration ring



means having an outer periphery and a first scale means disposed on said outer periphery of said ring means, said adjusting means comprising a second calibration means disposed in linear relationship with said cylinder member and said support means.

4,953,384

MAGAZINE-TYPE WIRING ACCESSORY CRIMPING TOOL

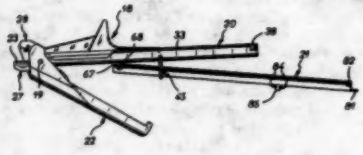
Alain Baillet, Montville; Francois Loisel, Maromme, and Daniel Paulin, Bosc Le Hard, all of France, assignors to Legrand, Limoges Cedex, France

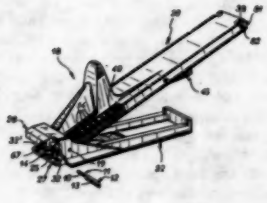
Filed Feb. 3, 1989, Ser. No. 305,638

Claims priority, application France, Feb. 5, 1988, 88 01355

Int. Cl.[5] B25B *27/14*; H01R *43/042*

U.S. Cl. 72—410 **31 Claims**





1. Magazine-type wiring accessory crimping tool comprising two handles articulated to each other, one of said handles defining a magazine removably receiving a dispenser, said dispenser accommodating a plurality of wiring accessories disposed parallel to one another, said dispenser being insertable into said magazine for loading the plurality of wiring accessories thereinto, access means through said magazine for providing direct access to wiring accessories in said dispenser to advance the same towards crimping means, said crimping means being defined on a first of said handles for forming at least one crimping deformation in a wiring accessory in position between said handles when squeezed together, the other of said handles being the first handle, said crimping means comprising a crimping blade, said one handle including a crosspiece aligned when the handles are squeezed together with said crimping blade, said crosspiece being adapted to withstand crimping force applied by said crimping blade, said handles crossing each other at an articulation zone where the handles are articulated to each other, free ends of said handles being adjacent said articulation zone, and constituting respective jaws, and the jaw on said one handle incorporating said crosspiece and the jaw on said other handle incorporating said crimping blade.

4,953,385

INFORMATION STORAGE STAMPER AND METHOD OF MANUFACTURING DISKS USING THE SAME

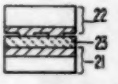
Masaki Aoki, Minou; Hideo Torii, Higashiosaka; Kiyoshi Kuribayashi, Neyagawa; Hideto Monji, Katano; Makoto Umetani, Hirakata, and Eiji Fujii, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 22, 1989, Ser. No. 396,622

Claims priority, application Japan, Aug. 22, 1988, 63-207660; Nov. 18, 1988, 63-292685

Int. Cl.[5] B21D *37/01*

U.S. Cl. 72—462 **8 Claims**



1. An information storage disk stamper-comprising a mother disk comprising, a cemented carbide alloy containing a tungsten carbide (WC) or a chromium carbide (Cr_3C_2) or a cermet, and an iridium (Ir) alloy film coated on said mother disk and having formed thereon guide grooves for tracking servo.

4,953,386

METHOD AND APPARATUS FOR PROVING ELECTRONIC GAS METERS

Arthur N. J. Pearman, St. Paul; Gerald D. Hunter, Lino Lakes; Robert E. Gilman, St. Michael; Michael A. Woessner, Golden Valley, and Daniel T. Lyden, Minneapolis, all of Minn., assignors to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 255,771, Oct. 11, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,595

Int. Cl.[5] G01F *25/00*

U.S. Cl. 73—3 **12 Claims**

1. A method for proof testing of an electronic gaseous fluid flow meter including a solid state fluid flow sensor and a signal processing circuit, the flow sensor of the meter providing a signal output indicative of fluid flow measured thereby, the signal processing circuit of the meter including timing means for generating periodically recurring timing signals defining sampling intervals for the meter, sampling means which samples the signal output of the fluid flow sensor during the sampling intervals to obtain flow measurement data representing the volume of fluid that has been passed through the meter, and memory means for storing the flow measurement data, the method comprising the steps of:

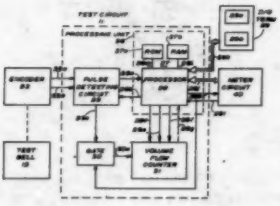
supplying to the meter under test a volume of a gaseous test fluid using a volume measurement standard apparatus;

generating an enabling signal for the signal processing circuit of the meter under test to cause the sampling means to start sampling the signal output of the fluid flow sensor during sampling intervals defined by the timing means and accumulating in the memory means of the meter measurement data representing the volume of test fluid measured by the meter in response to fluid flow through the meter during the sampling intervals;

generating a plurality of electrical pulses, the number of pulses generated being indicative of the actual volume of the test fluid which is passed through the meter during the test;

causing the signal processing circuit of the meter to enable a pulse counter to start registering the electrical pulses at the start of the first sampling interval during which the signal processing circuit of the meters starts sampling the signal output of the fluid flow sensor;

monitoring the pulse counter to determine when a preselected number of pulses has been registered by the pulse counter, the preselected number of pulses being indicative of a preselected volume of test fluid having been passed through the meter under test;



causing the meter to stop conducting fluid flow measurements when said preselected number of pulses has been registered by the pulse counter;

causing the signal processing circuit of the meter to disable the pulse counter at the start of the first sampling interval after the pulse counter registers said preselected number of pulses to stop the pulse counter from registering further pulses; and

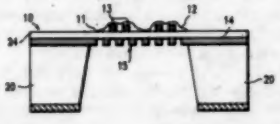
correlating measurement data stored in the memory means of the meter indicative of the volume of test fluid which is measured by the meter during the test with data representing the count registered by the pulse counter indicative of the actual volume of the test fluid passed through the meter during the test for proving the operation of the meter.

4,953,387

ULTRATHIN-FILM GAS DETECTOR

Christy L. Johnson; Johannes Schwank, and Kensall D. Wise, all of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jul. 31, 1989, Ser. No. 386,713
Int. Cl.[5] G01N *27/12*
U.S. Cl. 73—25.03 **27 Claims**



1. A device for detecting a gaseous species, comprising:

(i) a substrate having two opposed major surfaces and including a dielectric window region;

(ii) heater means situated on said dielectric window region on one of said opposed surfaces; and

(iii) a conductivity cell electrode means/thin transducing metal film assembly situated on said dielectric window region on the other of said opposed surfaces;

wherein:

said thin transducing metal film contacts said conductivity cell electrode means;

said heater means heats said thin transducing film; and

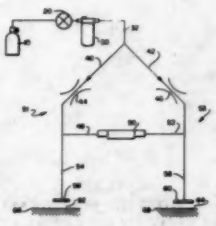
said conductivity cell electrode means senses the conductivity and capacitance of said thin transducing film.

4,953,388

AIR GAUGE SENSOR

Andrew H. Barada, New Canaan, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 25, 1989, Ser. No. 301,088
Int. Cl.[5] G01B *13/12*
U.S. Cl. 73—37.5 **1 Claim**



1. An air gauge sensor having low volumetric air flow resulting in minimum influence on particulate contamination on a surface for detecting an air gap between two surfaces comprising:

an air supply;

regulator means, associated with said air supply, for regulating the air pressure supplied by said air supply;

a filter through which air from said air supply flows;

a conduit attached to one end of said filter;

a junction dividing said conduit into a reference channel and a measurement channel;

a restrictor placed in each of said references and measurement channels, said restrictors each having an orifice substantially the same size;

a reference probe at the distal end of said reference channel forming a predetermined reference gap with a reference surface whereby air is released from said reference channel through the reference gap;

a measurement probe at the distal end of said measurement channel forming a gap with a surface whereby air is released from said measurement channel through the gap; and

mass air flow sensor means, coupled between said reference and measurement channels, for sensing the mass air flow therebetween, whereby there will be no mass air flow between said channels when said reference gap is equal to the gap.

4,953,389

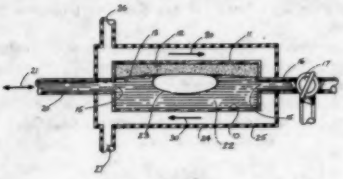
CAPTIVE BUBBLE SURFACE TENSIOMETER

Samuel Schurch, Calgary, Canada, assignor to University of Calgary, Calgary, Canada

Filed Oct. 17, 1989, Ser. No. 422,547
Claims priority, application Canada, May 2, 1989, 599518
Int. Cl.[5] G01N *13/02*
U.S. Cl. 73—64.4 **42 Claims**

1. A method of determining the interface tension between a gas and a liquid comprising the steps of providing a liquid

medium in a chamber, injecting a bubble of the gas into the liquid medium, increasing and decreasing the pressure of the



liquid medium within the chamber to reduce and expand said bubble, and determining the surface tension of the gas-liquid interface from the shape of said bubble.

4,953,390

METHOD AND A DEVICE FOR MEASURING THE AIR/FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

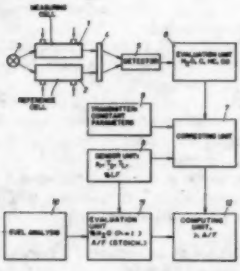
Peter W. Krempl, Ragnitz; Wolfgang Schindler, Graz, and Erich J. Schiefer, Selzthal, all of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof.Dr.Dr.h.c Hans List, Graz, Austria

Filed May 15, 1989, Ser. No. 351,215

Claims priority, application Austria, May 17, 1988, 1289/88

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—116 **25 Claims**



1. A method of measuring the air/fuel ratio (lambda) of an internal combustion engine to which fuel and gas for combustion are supplied and from which an exhaust gas is emitted, comprising the steps of:

(a) analyzing the fuel,

(b) measuring the concentration of water vapor in the exhaust gas,

(c) measuring the concentration of water vapor in the gas supplied for combustion of said fuel, and

(d) computing said air/fuel ratio from said concentration values obtained in steps (b) and (c) and from data on the molecular composition of said fuel obtained by the chemical analysis in step (a).

4,953,391

FLAT-TRACK UNIT FOR MOTOR VEHICLE TEST BEDS

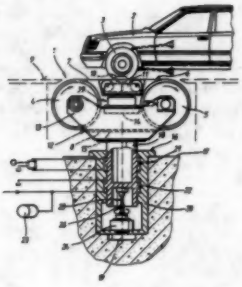
Karl Schober, Weinstadt, and Norbert Schaub, Remseck, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 30, 1989, Ser. No. 400,732

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830350

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117 **19 Claims**



1. A flat-track unit for motor vehicle test beds, comprising:

a roadway-simulating belt which is guided over two rollers for accommodating a vehicle wheel on a top on its upper side;

the top of the upper side of the belt is orientated roughly horizontally at ground level and is supported in a sliding or rolling manner at a wheel contact region by a supporting shoe;

the two rollers are mounted in a frame which is supported in a vertically floating manner and is mechanically guided in the vertical direction;

excitement means are provided to develop vertical oscillations in the frame;

the excitement means including a vertically orientated hydraulic cylinder and a cylinder housing locating roughly in line with wheel contact region;

one of the two rollers is connected via a universal-joint shaft to a drive and braking unit which is arranged to be vertically immovable and is spaced at a distance from the frame;

the drive and breaking unit is provided with an output shaft which is aligned with a roller axis of the one roller;

wherein the hydraulic cylinder of the excitement means is firmly secured on a foundation to resist tilting and rotation and has a piston and piston rod rigidly connected to the frame in terms of rotation and tilting to act as a mechanical vertical guide for the frame;

said piston being rotatable together with the cylinder housing forming a pivot bearing for pivoting the frame about a vertical axis;

a pivot drive means for pivoting the piston rod and its rigidly connected frame about the vertical axis;

wherein said universal-joint shaft between the one roller and the drive and braking unit is provided with length-compensation means having a diameter corresponding to a multiple of the diameter of corresponding to a multiple of the diameter of the universal-joint shaft;

wherein the drive and braking unit is attached to a drivable slide which is displaceable along a circular arc-shaped horizontal guide running concentrically to the vertical axis; and wherein there is

a drivable slide means for displacing the drivable slide as a function of a deflection angle of the universal-joint shaft to position the universal-joint shaft into a straightened position between the drivable slide an the one roller.

4,953,392

TIRE TEST MACHINE

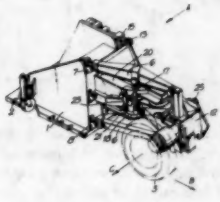
Clifford W. Barson, Staffs, Great Britain, assignor to Sumitomo Rubber Industries, Limited, Hyogo, Japan

Filed Oct. 19, 1989, Ser. No. 424,341

Claims priority, application United Kingdom, Nov. 9, 1988, 8826217

Int. Cl.[5] G01M 17/02

U.S. Cl. 73—146 6 Claims



1. A tire test machine involving a moving road surface and a tire and wheel suspension system, which comprises

a pair of triangular upper and lower main suspension frames, each lying substantially in a horizontal plane and having a first long side extending substantially in the direction of movement of the road surface, one end of the first long side of each frame being mounted at one corner to a fixed machine frame by a pivot bearing and the other ends of each of the first long sides being pivotally connected to the upper and lower ends respectively of a vertically extending axle support,

a wheel bearing assembly mounted to the axle support such that in the mid portion, the wheel axis is substantially perpendicular to the direction of movement of the road and the long sides of the two parallel main suspension frames,

vehicle load applying means acting between one of the first long sides and the machine frame to apply a vertical load,

an upper actuator disposed between the third corner of the upper main frame and the machine frame to apply a horizontal movement to said third corner in a direction parallel to the first side,

a lower actuator acting parallel to the first actuator to apply a horizontal movement to the third corner of the lower machine frame, and

a steering means connected to the wheel hub to cause rotation about the axle support such that the upper and lower actuators act together to provide tire lateral movement proportional to the average movement of the actuators and camber movement proportional to the difference of the said movements.

4,953,393

TRANSDUCER

Philip E. Galasko, Sandton, and Frans J. Kruger, Pretoria, both of South Africa, assignors to Philip Elliot Galasko, Sandton, South Africa

Filed Jul. 2, 1987, Ser. No. 69,309

Claims priority, application South Africa, Jul. 4, 1986, 86/4988; Dec. 23, 1986, 86/9672

Int. Cl.[5] B60C 23/02; G01L 9/12

U.S. Cl. 73—146.5 26 Claims

1. A passive electrically operable monitoring means for use with a transducer for monitoring a physical parameter, the monitoring means having an inherent resistance and a characteristic capacitance and inductance only, the characteristic capacitance and inductance being responsive to variations in the physical parameter such that the monitoring means has a

natural frequency of oscillation that varies in accordance with variations in the physical parameter.

4,953,394

DEVICE AND PROCESS FOR CONTROLLING AIR PRESSURE IN TIRES

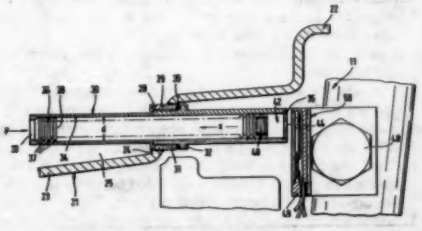
Horst Franke, Aalen, and Hans-Jörg Schmid, Aalen-Essingen, both of Fed. Rep. of Germany, assignors to Alligator Ventilfabrik GmbH, Giengen/Brenz, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 255,036

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734053; Aug. 12, 1988, 3827354

Int. Cl.[5] B60C 23/02

U.S. Cl. 73—146.5 21 Claims



1. Apparatus for monitoring the air pressure in a pneumatic tire carried by the rim of a vehicle wheel which comprises: a pneumatic tire having a tire air space; a vehicle wheel having a rim carrying said tire along an axis; a sensing element arranged at the rim which can be deformed and acted upon by tire pressure; a permanent magnet as a measurement value generator connected to the sensing element; a measurement value sensor in operative relationship to the permanent magnet arranged in the region of rotary movement of the wheel and fixed to the vehicle in a stationary position; an evaluation circuit connected to the measurement value sensor; wherein the sensing element is in the form of a bellows mounted with a substantially axis-parallel direction of movement; and wherein the permanent magnet which is connected to the sensing element is displaceable in axis-parallel relationship at the outside of the tire in dependence on the tire pressure, wherein at normal tire pressure the permanent magnet remains in a position close to the measurement value sensor with a greater spacing therebetween at reduced tire pressure, said apparatus including an attachment housing on the rim with said bellows projecting from said attachment housing into the tire air space, a bistable rocker member for moving said permanent magnet and an axial rod connecting said bellows with said rocker member, wherein said permanent magnet is mounted in axis-parallel relationship.

4,953,395

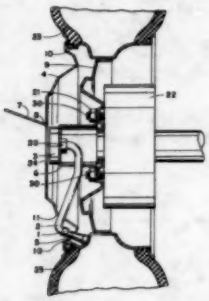
TIRE PRESSURE INDICATOR

James E. Jard, 508 W. Holly Rd., Virginia Beach, Va. 23451

Continuation-in-part of Ser. No. 206,666, Jun. 15, 1988, abandoned. This application Jan. 24, 1990, Ser. No. 471,665

Int. Cl.[5] **B60C** *73/02*

U.S. Cl. 73—146.8 **11 Claims**



1. An air pressure measuring device for measuring the pressure of pneumatic tires mounted on lug bolt-mounted tire rims, comprising:

an air pressure gauge;

a gauge mounting member;

means for attaching said gauge to said gauge mounting member;

means for attaching said gauge mounting member to said lug bolts;

a pneumatic conduit, said pneumatic conduit being in communication with said air pressure gauge at one end and means for attaching the other end of said conduit to a valve stem of said pneumatic tire;

said gauge being disposed approximately at the centerline of said tire rim;

said means for attaching said gauge mounting member to said lug bolts comprising at least two threaded nuts;

said means for attaching said pneumatic conduit to said valve stem comprising a threaded female fitting;

a wheel rim covering member attachable to said tire rim by which said threaded nuts are enclosed between said wheel rim covering member and said tire rim;

a first opening disposed in the center of said wheel rim covering member through which said air pressure gauge is visible;

a second opening in said wheel rim covering member through which said pneumatic conduit passes;

and means for temporarily closing said first opening in said wheel rim covering member, comprising a door pivotally attached to said wheel rim covering member.

4,953,396

LEAK DETECTOR FOR CONTAINERS

John W. Langsdorf, Crystal, and Tina O. Outlaw, Inver Grove Heights, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 18, 1989, Ser. No. 395,832

Int. Cl.[5] **G01M** *3/32*

U.S. Cl. 73—49.3 **16 Claims**

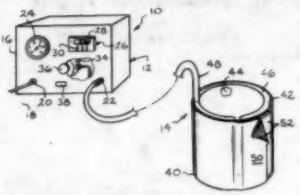
1. A leak detection apparatus for a container comprising, in combination,

regulator means for providing air at a pressure of less than about 500 mm Hg,

timing means for providing an adjustable cycle time,

a valve means having an inlet port in fluid communication with said regulator means for providing air, a vent port to atmosphere, a common port outlet and an operator coupled to said timing means for alternately and exclusively placing said common port in fluid communication with said inlet and said vent, and

a shroud for receiving a container to be tested, said shroud



including releasable means for securing said shroud about said container, at least one inflatable air chamber and means for providing fluid communication between said air chamber and said outlet of said valve means.

4,953,397

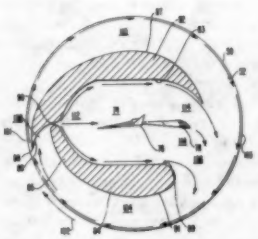
CONTINUOUS FLOW HYPERSONIC CENTRIFUGAL WIND TUNNEL

Robert L. Burton, Salem, Va., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 25, 1989, Ser. No. 384,638

Int. Cl.[5] **G01M** *9/00*

U.S. Cl. 73—147 **17 Claims**



1. A wind tunnel for testing an aerodynamic surface, said tunnel comprising:

rotor means defining a cylindrical cavity for circulating a gas around the periphery of said cavity;

first and second elements each having inner and outer surfaces extending between a nozzle end and an exhaust end of said wind tunnel, said elements being mounted in opposed relation in said cavity, the inner surfaces of said elements cooperating to define a nozzle, a test region and an exhaust region;

means disposed proximate said nozzle for diverting a predetermined portion of said circulating gas through said nozzle, test region, and exhaust region, the exhaust region being open to said cavity to permit the diverted gas to rejoin the circulating gas; and

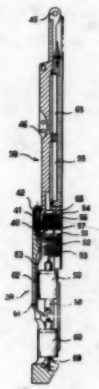
means for mounting said aerodynamic surface in said test region.

4,953,398

METHOD AND APPARATUS FOR DETECTING ACOUSTIC VIBRATIONS IN A BOREHOLE

Jean-Pierre Masson, Richmond, Tex.; Jacky Bourseul, Saclay, and Claude Fierfort, Lozere, both of France, assignors to Schlumberger Technology Corp., New York, N.Y.

Filed Oct. 19, 1988, Ser. No. 260,088
Claims priority, application France, Oct. 27, 1987, 87 14812
Int. Cl.[5] E21B *47/00*
U.S. Cl. 73—151 18 Claims



18. A resilient suspension for an acoustic vibration detector placed in a fluid, comprising two helical portions in endwise arrangement having reversed directions of winding, said portions having the same length, said portions being made of a tubular wire capable of withstanding pressure and having routed therein an electrical conductor provided for connection to the detector.

4,953,399

METHOD AND APPARATUS FOR DETERMINING CHARACTERISTICS OF CLAY-BEARING FORMATIONS

Walter H. Fertl, and Ashok E. Sinha, both of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 177,941, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 829,340, Feb. 14, 1986, Pat. No. 4,756,189, which is a continuation-in-part of Ser. No. 416,826, Sep. 13, 1982, Pat. No. 4,594,887. This application May 16, 1989, Ser. No. 353,221
Int. Cl.[5] E21B *49/00*
U.S. Cl. 73—152 10 Claims

1. A method of determining the relative percentages of a plurality of three known different types of clay groups present in a subsurface shaly sand formation, comprising the steps of:

determining a plurality of log derived characteristics of the shaly sand formation;

determining the total volume of clay including all of the plurality of known different types of clay groups contained within the shaly sand formation in response to said log derived characteristics of said shaly sand formation;

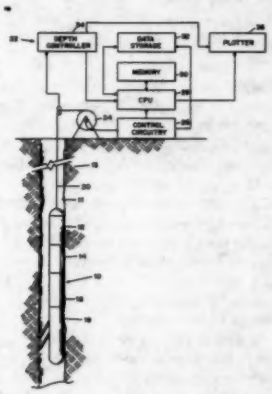
determining a hydrogen index value for said total volume of clay;

determining a cation exchange capacity value for said total volume of clay;

establishing a hydrogen index value solely related to each of the plurality of known clay groups present in said volume of clay in response to said log derived characteristics of said shaly sand formation, said total volume of clay and said hydrogen index therefor;

establishing a cation exchange capacity value solely related to each of the plurality of known clay groups present in said volume of clay in response to said log derived characteristics of said shaly sand formation, said total volume of clay and said cation exchange capacity therefor;

establishing a parameter for each of the plurality of known clay groups directly related to said established hydrogen index and cation exchange capacity values established therefor;



establishing a clay group reference comprising said parameters established for each of the plurality of known clay groups; and

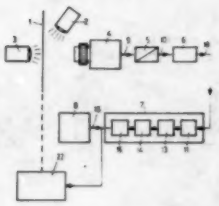
comparing said hydrogen index and cation exchange capacity values determined for the total volume of clay with said established clay group reference for determining the relative percentage of each of the plurality of known different types of clay groups.

4,953,400

METHOD OF MEASURING THE YARN DENSITY OF A WOVEN FABRIC OR THE STITCH DENSITY OF A KNIT FABRIC FOR READJUSTING THE PRODUCTION MACHINE IN QUESTION

Filip O. P. Bossuyt, Kortrijk, Belgium, assignor to "Wetenschappelijk en Technisch Centrum van de Belgische Textielnijverheid", afgekort tot "Centexbel", Brussels, Belgium

Continuation-in-part of Ser. No. 152,364, Feb. 4, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 394,270
Claims priority, application Belgium, Feb. 5, 1987, 08700088
Int. Cl.[5] G01B *11/00*; D03D *51/00*
U.S. Cl. 73—159 30 Claims



1. A method of measuring the yarn density of a woven fabric comprising:

recording a video image of the woven fabric to be examined by means of a video camera, converting the video image by an analog-to-digital converter into digital video data, storing the digital video data in a digital image memory,

retrieving and passing the digital image memory data to a central processing unit and converting said data by said central processing unit into the yarn density whereby said converting by said central processing unit comprises converting said digital image memory data by a digital band filter with a central circle frequency 107 $_o$ which digital band filter is arranged in such a manner that it operates according to the formula:

$$Y_K = A_m \cdot X_{k-m} + A_{m-1} \cdot X_{k-m+1} \cdots + A_o X_k - B_1 \cdot Y_{k-1} - B_2 Y_{k-2} \cdots - B_n Y_{k-n}$$

wherein:

X_k represents a series of points of the digital information characteristic at interspace T before the digital filtering; Y_k represents the said series of points k of the filtered digital information characteristic via digital filtering at the same interspace T; the coefficients A and B are a function of the quality Q, the central circle frequency ω_o and the interspace T, the converting by said digital band filter being followed by a computation proper of the yarn density from the data converted by said filter.

9. An apparatus for measuring the yarn density of a woven fabric, which comprises:

a video camera for recording an analog video image of the woven fabric to be examined,

an analog-to-digital converter for converting the analog video image into digital video data,

an image memory for storing the digital video data, and

a processing unit for converting the digital video data into the yarn density, said processing unit comprising a digital filter with central circle frequency ω_o and operating according the formula:

$$Y_k = A_m \cdot X_{k-m} + A_{m-} \cdot X_{k-m+} \cdots + A_o X_k - B_1 \cdot Y_{k-1} - B_2 Y_{k-2} \cdots - B_n Y_{k-}$$

wherein:

X_k represents a series of points of the digital data characteristic at interspace T before the digital filtering; Y_k represents the said series of points k of the filtered digital data characteristic via digital filtering at the same interspace T; the coefficients A and B are a function of the quality Q; the central circle frequency ω_o and the interspace T, and a computer unit for the computation proper of the yarn density from the data converted by said filter.

4,953,401

METHOD FOR DETERMINING THE QUALITY OF GLUTEN IN WHEAT

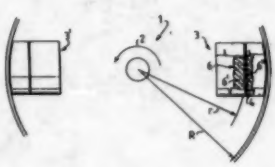
Harald Perten, Sonder 14-17, CH-9042 Speicher, Switzerland

PCT No. PCT/SE87/00514, § 371 Date Jul. 3, 1989, § 102(e) Date Jul. 3, 1989, PCT Pub. No. WO89/04483, PCT Pub. Date May 18, 1989

PCT Filed Nov. 3, 1987, Ser. No. 391,523

Int. Cl.[5] G01N *33/10*

U.S. Cl. 73—169 **11 Claims**



1. A method of determining the quality of gluten in wheat, in which method a gluten sample taken from a wheat dough is placed on a sieve in a centrifuge and centrifuged against the sieve, characterized by determining the extent to which the gluten sample penetrates the sieve under the influence of the centrifugal force generated and taking this extent of penetration as a measurement of the gluten quality.

4,953,402

WIND MEASURING SYSTEM (ANEMORHUMBOMETER)

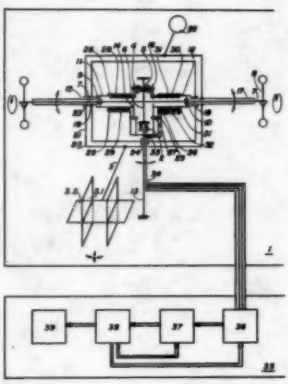
Valentin S. Tersiev, Sofia, Bulgaria, assignor to TK "Orgtechnika" , Silistra, Bulgaria

Filed Aug. 16, 1989, Ser. No. 395,122

Claims priority, application Bulgaria, Aug. 16, 1988, 85256

Int. Cl.[5] G01W *1/02*

U.S. Cl. 73—189 **6 Claims**



1. A wind measuring system comprising

a velocity sensor, a horizontal direction sensor and a vertical direction sensor;

said velocity sensor comprising a reference disk and a first stationary optical sensor, said reference disk being mechanically driven to rotate in a first direction by a velocity component of the wind, said first optical sensor sensing the speed of rotation of said reference disk in said first direction;

said horizontal direction sensor comprising a second optical sensor movable relative to said reference disk, movement of said second optical sensor being mechanically driven in a direction parallel to said first direction by a horizontal direction component of the wind, said second optical sensor sensing a position relative to said first optical sensor by reference to said reference disk;

said vertical direction sensor comprising a third optical sensor movable relative to said reference disk, movement of said third optical sensor being mechanically driven in a direction parallel to said first direction by a vertical direction component of the wind, said third optical sensor sensing a position relative to said first optical sensor by reference to said reference disk; and

circuit means for calculating wind velocity and horizontal and vertical wind direction based respectively on the speed of rotation of the reference disk and the positions of the second and third sensors relative to the first sensor.

4,953,403

POSITIVE DISPLACEMENT FLUSHABLE FLOW METER

Carl M. Springer, Barrington, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.

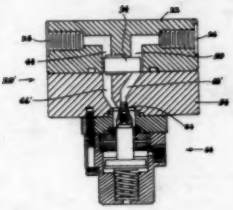
Filed Mar. 15, 1989, Ser. No. 324,389

Int. Cl.[5] G01F *3/10, 15/12*

U.S. Cl. 73—198 **11 Claims**

1. A positive displacement flow meter for measuring the

volume flow of liquid coating material delivered to spray coating apparatus and for being flushed clean of coating material by fluidic flushing media, said flow meter comprising a housing having inlet passage means and outlet passage means; means for supplying either liquid coating material at a first volume flow rate and under pressure or fluidic flushing media at a second and greater volume flow rate and under pressure to said inlet passage means; movable liquid flow sensing means intermediate said inlet and outlet passage means for flow therethrough of coating material and flushing media from said inlet to said outlet passage means, said sensing means being moved



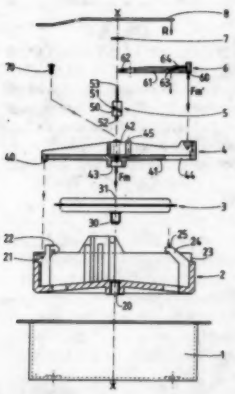
in response to and at a rate in accordance with the volume flow rate of coating material or flushing media therethrough and generating an indication of the volumetric flow of coating material flowing therethrough; bypass valve means for selectively shunting a portion of the fluid in said inlet passage means around said flow sensing means to said outlet passage means; and means for operating said bypass valve means so that no fluid is shunted around said flow sensing means when coating material is supplied to said inlet passage means so that a portion of the fluid is shunted around said flow sensing means when flushing media is supplied to said inlet passage means.

4,953,404

MECHANISM FOR AN ANEROID BAROMETER

Christian Bouteille; Pascal Blaise; Gabriel Bosson; Emile Mesnier, all of Morteau, and Pierre Vuillemin, Villiers le Lac, all of France, assignors to Altitude S.A., De Gauele, France

Filed Jun. 13, 1989, Ser. No. 365,419
Claims priority, application France, Jun. 17, 1988, 88 08407
Int. Cl.[5] G01L *7/12*
U.S. Cl. 73—387 **4 Claims**



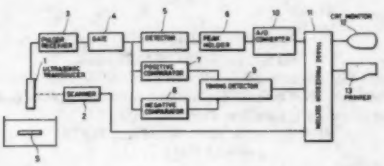
1. A apparatus that is an aneroid barometer comprising a support which houses means for detecting barometric changes, said means comprised of an aneroid cell fixed to the support, a primary lever in contact with the cell, the lever being fixably mounted at one end to the support, said end comprising the axis of rotation of the lever, the lever carrying an endless screw integrally attached to the primary lever, said endless screw having means for receiving an end of a secondary lever and said screw having a spindle which carries an indicator needle, a secondary lever contacting the upper end of the primary lever, said secondary lever possessing means for rotating the endless screw, a spring which bears upon the support and the secondary lever and exerting a resisting force upon the secondary lever which transmits it to the primary lever, the combined action of the aneroid cell, primary lever, secondary lever, endless screw, means for receiving an end of the secondary lever, and spring comprising means for converting the deformation of the aneroid cell into angular rotational movement of the indicator needle, said movement being measured by means of a dial, wherein the center **(43)** of the primary lever **(4)** is held in contact with the center **(31)** of the cell **(3)** by a spring **(8)**, the axis of rotation **(40)** of this lever being located in a housing **(21)** at the periphery of the support **(2)**, the free end **(41)** of the primary lever supporting the axis of rotation **(60)** of the secondary lever **(6)** at the level of a notch **(23)** of the support.

4,953,405

ULTRASONIC MEASURING APPARATUS FOR MEASURING A PREDETERMINED BOUNDARY SURFACE INSIDE AN OBJECT

Kazuhiko Hara, Yokohama; Toshiaki Takahashi, Tachikawa, and Masato Nagura, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,814
Claims priority, application Japan, Mar. 29, 1988, 63-77829
Int. Cl.[5] G01N *29/00*
U.S. Cl. 73—602 **7 Claims**



1. An ultrasonic measuring apparatus for measuring a predetermined boundary surface inside an object, comprising:

pulse generating means for transmitting an ultrasonic pulse to the object;

moving means for moving said pulse generating means in two dimensions relative to said object;

reception means for receiving a reception signal generated when said ultrasonic pulse is reflected by the object;

means for taking a reflected signal out from the boundary surface, passing the reflected signal through a time gate according to the depth of the boundary surface to be examined inside the object;

level detection means for detecting a level of a reflected signal from the boundary surface, and producing an output;

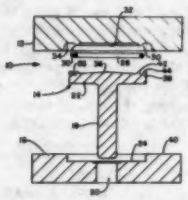
phase detection means, different from said level detection means, for detecting a phase of a reflected signal from the boundary surface, and producing an output;

means for providing the output from said level detection means with either a positive or a negative sign in accordance with the output from said phase detection means and for outputting the output from said level detection means provided with positive or negative signs as measurement data;

memory means for storing each measurement data obtained at each measurement position on the boundary surface; and

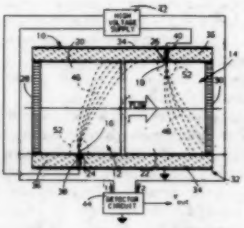
means for forming and outputting an ultrasonic image of the boundary surface, in two dimensions, in accordance with the data of each measurement position on the boundary surface stored in said memory means.

4,953,406
RHEOMETER DIE ASSEMBLY
John B. Putman, 4638 Commodore Dr., Stow, Ohio 44224
Filed Oct. 2, 1989, Ser. No. 416,025
Int. Cl.[5] G01N *3/24*
U.S. Cl. 73—843 20 Claims



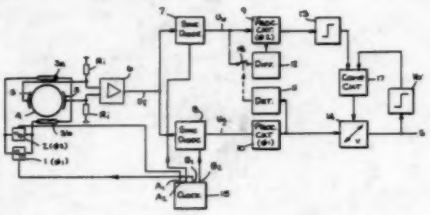
1. A rheometer die assembly, comprising:
an upper die having a horizontal surface;
a lower die having a horizontal surface; and
seal means interposed between said horizontal surfaces of said upper and lower dies for sealing said dies in contacting engagement with each other and defining a cavity therebetween.

4,953,407
ION-DRAG FLOWMETER
Gerard W. Malaczynski, Bloomfield Hills, and Thaddeus Schroeder, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 8, 1988, Ser. No. 229,873
Int. Cl.[5] G01F *1/56*
U.S. Cl. 73—861.09 15 Claims



1. In a method for measuring the flow rate of a gas including a variable concentration of polar molecules, the method involving the steps of:
generating a stream of ions that is deflected by the gas flow wherein the amount of deflection is dependent upon the concentration of polar molecules in the gas, and
sensing the degree of deflection of the ion stream to provide a measure of the gas flow rate,
an improvement comprising the additional step of:
keeping the ambient electric field sufficiently weak that the deflection of the ion stream is rendered independent of the concentration of polar molecules in the gas.

4,953,408
CAPACITIVE TYPE ELECTROMAGNETIC FLOWMETER
Eggert Appel, Dransfeld; Wilfried Kiene, Muenden; Rudi Kuchemann, Hardegsen; Dieter Meier, Gottingen, and Peter Nissen, Rosdorf, all of Fed. Rep. of Germany, assignors to Fischer & Porter Company, Warminster, Pa.
Filed Aug. 30, 1989, Ser. No. 400,558
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829564
Int. Cl.[5] G01F *1/60*
U.S. Cl. 73—861.16 7 Claims



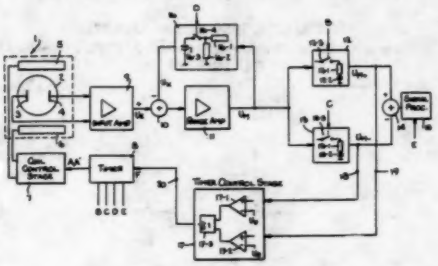
1. An electromagnetic flowmeter of the capacitive type comprising:
(a) a primary having a flow tube through which a fluid to be metered is conducted to intercept a composite magnetic field produced by a pair of electromagnet coils to induce therein a signal voltage which is picked up by a pair of capacitive electrodes, said composite field being formed by a low-frequency comparison field having a long period and a high-frequency switched field having a short period; and
(b) a secondary including an input amplifier to which said signal voltage from the primary is applied through a high-pass filter, said input amplifier yielding an amplified output voltage originating from the composite field, means to analyze said output voltage to derive therefrom separate components, one originating from the comparison field and the other from the switched field, and means to produce an output signal in accordance with the time phasing of said components after compensating for the signal loss experienced in the filter by the comparison field component by means of a compensation voltage derived from the switched field component.

4,953,409
NOISE AND OFFSET VOLTAGE-COMPENSATED ELECTROMAGNETIC FLOWMETER
Werner Marchewka, Neu-Eichenberg; Karl-Heinz Rackebrandt, Adelhaen; Klaus Schäfer, Hann-Münden, and Albert Seebode, Rosdorf, all of Fed. Rep. of Germany, assignors to Fischer & Porter Company, Warminster, Pa.
Filed Aug. 31, 1989, Ser. No. 401,318
Int. Cl.[5] G01F *1/60*
U.S. Cl. 73—861.17 7 Claims

1. A flowmeter provided with a primary in which a fluid whose flow rate is to be metered is conducted through a flow tube to intersect a magnetic field established therein by electromagnet coils to induce a voltage therein that is transferred to electrodes to produce an electrode signal that depends on flow rate and includes a noise voltage, and a secondary operatively coupled to the primary, said secondary comprising:
(a) an input amplifier responsive to the electrode signal from the primary;
(b) a summing stage having two inputs, to one of which is applied the output of the input amplifier;
(c) a range amplifier responsive to the output of the summing stage to produce a test signal voltage, said input and range amplifiers having offset voltages produced therein which

together with the primary noise voltage disturb the accuracy of the flowmeter; and

(d) means to derive from the test signal voltage a compensating voltage which is applied to the other input of a summing stage to effect compensation for said noise and offset voltages when the test signal voltages exceed a predetermined threshold value.

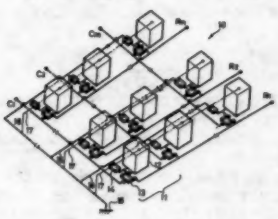


4,953,410

PRESSURE DISTRIBUTION DETECTING DEVICE

Jun Tabota, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 25, 1989, Ser. No. 398,741
Claims priority, application Japan, Aug. 25, 1988, 63-211718
Int. Cl.[5] G01L *1/22, 5/16*
U.S. Cl. 73—862.04 4 Claims



4. A pressure distribution detecting device, comprising:

a plurality of piezo-electric sensor elements arranged in a first direction and a second direction intersecting therewith;

each of said piezo-electric sensor elements comprising a piezo-electric element for outputting a voltage corresponding to a pressure change, and switching means connected to said piezo-electric element;

a plurality of control lines extending in said first direction for rendering said switching means conductive;

a plurality of reading lines extending in said second direction and connected to said switching means for reading an output voltage of said piezo-electric element;

selecting means for selecting a piezo-electric element whose output voltage is to be read by controlling said plurality of control lines; and

accumulating means for accumulating an output voltage read from a piezo-electric element selected by said selecting means through a reading line;

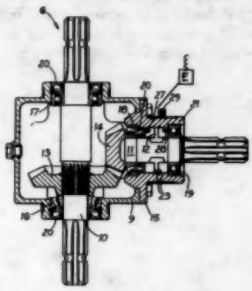
said accumulating means accumulating an increment or decrement of an output voltage in each piezo-electric element.

4,953,411

ANGULAR BEVEL GEAR DRIVE FOR AGRICULTURAL IMPLEMENTS

Karl Coenen, Siegburg; Michael Flanhardt, Cologne, and Hans-Jürgen Langen, Frechen, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Siegburg, Fed. Rep. of Germany

Filed May 8, 1989, Ser. No. 348,818
Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816828
Int. Cl.[5] G01L *3/10, 3/12*
U.S. Cl. 73—862.33 7 Claims



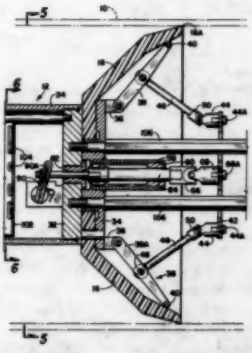
1. An angular bevel gear drive for the drive of, or the drives in, agricultural implements, having an input shaft and at least one output shaft, with the input shaft and/or at least one output shaft being associated with a torque measuring device, wherein the drive comprises a housing, and at least one individual bearing unit for a bevel gear detachably mounted on the housing in which unit a torque measuring device is integrated, the torque measuring device being a measuring device operating in a contact-free way and being arranged between two bearings for supporting a shaft in the bearing unit.

4,953,412

PIPELINE CALIPER PIG

Jeffrey S. Rosenberg, and Kevin W. Lockyear, both of Tulsa, Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.

Filed Jan. 17, 1986, Ser. No. 822,755
Int. Cl.[5] G01B *5/00*
U.S. Cl. 73—865.8 15 Claims



1. An improved pipeline caliper pig for providing indica-

tions of the deviations of an inner wall of a pipeline from a nominal cross-sectional configuration, comprising:

a pig body assembly having a longitudinal axis and means for supporting the pig body assembly in a pipeline and for impeding the flow of fluid therepast so that the pig body is propelled by such fluid along the pipeline;

an integrator plate carried by said pig body assembly;

means for deflecting said integrator plate in response to deviations in the internal pipeline wall;

means for axial oriented detection of the deflection of said integrator plate and for recording the detected deflections; and

means for simultaneously determining and recording the orientation of said pig body assembly about its longitudinal axis relative to the vertical whereby the axial orientation of detected deviations is determinable.

4,953,413

DRIVING DEVICE HAVING A VIBRATOR

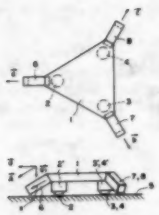
Koji Iwata; Shigeru Okuma, both of Nagoya; Yoshimasa Kimura, Yokohama; Yoshihiro Konata, Tokyo, and Kiyoshi Kaneko, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 103,712, Oct. 2, 1987, abandoned. This application Jan. 5, 1990, Ser. No. 464,635

Claims priority, application Japan, Oct. 6, 1986, 61-237444; Oct. 8, 1986, 61-237445

Int. Cl.[5] H01L *41/09*

U.S. Cl. 74—1 SS **12 Claims**



1. A driving device comprising:

(a) a base plate

(b) a plurality of drive sources disposed at different portions on said base plate, each of said plurality of drive sources having a vibrator adapted to vibrate upon application of an electrical signal thereto and causing relative movement between said base plate and a contact surface contact surface by the vibration of each of said vibrators;

(c) sensor means respectively provided for each of said drive sources, each of said sensor means detecting the driving state of each said drive sources;

(d) a first adjusting circuit respectively provided for each of said drive sources for individually adjusting the electrical signal applied to each of said drive sources on the basis of the output from said sensor means; and

(e) a second adjusting circuit for adjusting a common electrical signal applied to all of the drive sources on the basis of combined outputs from all of the sensor means.

4,953,414

OVERHANG-TYPE STARTER

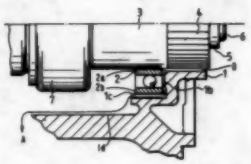
Hirokazu Ueno, and Hiroyuki Morikane, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,571

Claims priority, application Japan, Jun. 3, 1988, 63-74439[U]

Int. Cl.[5] F02N *15/06*

U.S. Cl. 74—6 **3 Claims**



1. An overhang-type starter comprising:

a front bracket having a substantially horizontal bearing support portion and an interior portion;

a ball bearing structure fixedly fitted in said front bracket to said support portion and having an upper and lower portion;

a pinion drive shaft supported by and moveable over said ball bearing structure;

a pinion formed on said pinion drive shaft at the front end thereof, said pinion being moveable with said shaft, said pinion being disposed with respect to said front bracket such that a gap is formed in communication with said upper portion of said bearing structure; and

a water drain hole provided in the bearing support portion of said front bracket at said lower portion of said ball bearing structure and a water drain passage that communicates between said hole and said interior portion of said front bracket.

4,953,415

ARRANGEMENT FOR CONVERTING RECIPROCATING MOTION INTO EVEN ROTATIONAL MOTION

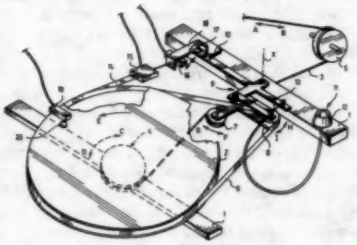
Kari Lehtonen, Paimio, Finland, assignor to Tunturipyora Oy, Turku, Finland

Filed Aug. 4, 1989, Ser. No. 389,518

Claims priority, application Finland, Aug. 10, 1988, 883726

Int. Cl.[5] F16H *27/02*; A63B *69/06*; F16D *49/10*

U.S. Cl. 74—141 **6 Claims**



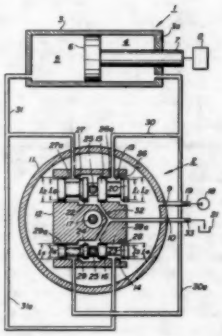
1. An arrangement for converting reciprocating motion into even rotational motion, comprising a frame (1, 31) and a flywheel (2, 32) placed thereon, a pull member (3, 33) being attached to the flywheel by means of a free gear mechanism (4, 34) so as to move in a reciprocating manner and a braking band being arranged around the flywheel (2, 32) so as to be pressed against its peripheral surface, whereby the flywheel (2, 32) is

arranged to rotate in a predetermined direction when the pull member is pulled and the brake band is arranged to resist the rotational motion of the flywheel, characterized in that the arrangement comprises a relieve means (7, 37) connected to the brake band (6, 36) and to the frame (1, 31) by means of a lever mechanism (9, 39), whereby the pull member (3, 33) is arranged to be pressed against the relieve means (7, 37) during a pulling movement along a direction (A) and to pivot the lever mechanism (9, 39) so that the brake band is tightened against the flywheel (2, 32), the lever mechanism (9, 39) being arranged to pivot so that tightening force exerted by the brake band (6, 36) on the peripheral surface of the flywheel (2, 32) is decreased when the pull member is displaced by the free gear mechanism (4, 34) in a direction (B) opposite to the pulling direction, and a detector (16, 17) connected to the lever mechanism (9, 39) for detecting a number of pivoting movements of the lever mechanism (9, 39).

4,953,416
POWER STEERING VALVE WITH TWO SPOOLS OF DIFFERENT SIZE TO COMPENSATE UNBALANCED CYLINDER

Koichi Komatsu, Atsugi, Japan, assignor to Atsugi Motor Parts Company Limited, Atsugi, Japan

Filed Aug. 21, 1985, Ser. No. 767,330
Int. Cl.[5] B62D *5/08*
U.S. Cl. 74—388 PS **9 Claims**



1. An automotive steering system having an unbalanced cylinder and a fluid control valve disposed in a hydraulic circuit connecting said cylinder to a fluid pressure source and to a fluid reservoir for controlling supply and drain of working fluid to said cylinder, comprising:

said unbalanced cylinder having:

an enclosed hollow cylinder;

a piston disposed within the internal space of said cylinder so as to divide same into first and second working chambers; and

a piston rod connected to said piston at one end and connected at the other end to a steering member which actuates re-alignment of vehicular wheels for steering, said piston rod extending through said first chamber and exiting said cylinder for connection to said steering member at said other end;

said fluid control valve having:

a valve housing connected to a manually operable steering stub shaft by means of a yielding structural member;

first and second bores passing through a valve body, said first and second bores having axes extending substantially parallel to each other and substantially perpendicular to said steering stub shaft and having one end communicating with a pressurized fluid chamber, said first bore having a larger internal diameter than that of said second bore;

first and second spool valves disposed reciprocably within said first and second bores respectively, said first and second spool valves being connected to said steering stub shaft so as to be driven reciprocably in response to relative displacement between said valve housing and said steering stub shaft due to yielding of said yielding member, and said first spool valve having first, second, third and fourth lands respectively having an external diameter substantially corresponding to the internal diameter of said first bore for defining between said first and second lands a first working chamber communicating with said first chamber of said cylinder via a first port, between said second and third lands a third drain chamber communicating with a first drain line, szid second spool valve having fifth, sixth, seventh and eighth lands having an external diameter substantially corresponding to the internal diameter of the second bore for defining between said fifth and sixth lands a fourth working chamber communicating with said second chamber of said cylinder via a fourth port, between said seventh and eighth lands a fifth working chamber communicating with said first chamber via a fifth port, and between said sixth and seventh lands a sixth drain chamber communicating with a second drain line, said first and fourth working chambers being in communication with said pressurized fluid chamber, and said second and fifth working chambers being in communication with said third and sixth drain chamber;

first means defining a first supply orifice for establishing and blocking fluid communication between said first working chamber and said pressurized fluid chamber and a first drain orifice for establishing and blocking fluid communication between said second working chamber and said third drain chamber, between said first spool valve and the inner periphery of said first bore, the flow cross-section of said first supply orifice varying with the position of the first spool valve for control of the supply of working fluid to said first working chamber in said cylinder, and the flow cross-section of said first drain orifice varying with the position of said first spool valve for control of drainage of working fluid from said second working chamber; and

second means for defining a second supply orifice for establishing and blocking fluid communication between said fourth working chamber and said pressurized fluid chamber and a second drain orifice for establishing and blocking fluid communication between said fifth working chamber and said drain chamber, between said second spool valve and the inner periphery of said second bore, the flow cross-section of said second supply orifice varying with the position of said second spool valve for control of the working fluid supply to said second working chamber of said cylinder, and the flow cross-section of said second drain orifice varying with the position of said second spool valve for control of drainage of working fluid from said first chamber of said cylinder, and said flow cross-section of said first supply orifice and said first drain orifice being greater than that of the corresponding second supply orifice and second drain orifice.

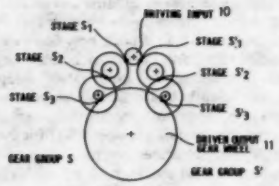
4,953,417
MECHANICAL GEAR DRIVE

Klaus Baumgarten, Eglharting, and Kurt Schloeglmann, Taufkirchen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,438
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1988, 3809577
Int. Cl.[5] F16H *55/18*
U.S. Cl. 74—409 **5 Claims**

1. A mechanical closed gear drive train, comprising a driving input wheel (10), a driven output wheel (11), and a plurality of intermediate stage wheels engaged between said driving input wheel (10) and said driven output wheel, said intermedi-

ate stage wheels between said driving input wheel (10) and said driven output wheel (11) being arranged in two sets parallel to each other to form said closed gear drive train, prestressed torsion spring means (12) directly connected in at least one location anywhere in said closed gear drive train (S1 to S'3), and means (13) for adjusting a biasing force of said torsion spring means (12), said adjusting means being located any-



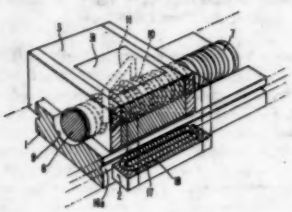
where in said closed gear drive train, said adjusting means being adjusted so that a respective spring prestressing torque is greater than a maximum torque at which said gear drive should still run without backlash or play, for eliminating any backlash and avoiding any play between said driving input wheel and said driven output wheel, said biasing force being constantly effective for self-adjusting said closed gear drive train.

4,953,418

LINEAR FEED MECHANISM

Kazuya Hirose, Tokyo, Japan, assignor to Hihaisuto Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1989, Ser. No. 347,901
Claims priority, application Japan, Feb. 3, 1988, 63-23391
Int. Cl.[5] F16H *26/22, 25/24;* F16C *29/06*
U.S. Cl. 74—424.8 A **10 Claims**



1. A linear feed mechanism comprising:

a track member having a top face with a semi-circular groove formed therein, and said track member semi-circular groove having a substantially smooth surface;

a moving member movably disposed on said track member and having a bottom face, said moving member having a semi-circular groove formed in said bottom face thereof, said moving member semi-circular groove having a spirally threaded face, and said moving member semi-circular groove and said track member semi-circular groove jointly defining a substantially circular through hole formed between said track member and said moving member;

a linear motion bearing means disposed between said track member and said moving member for movably supporting said moving member on said track member;

a threaded ball screw shaft rotatably attached to said track member and disposed in said through hole, said threaded ball screw shaft having a spiral thread on the outer surface thereof corresponding to said spirally threaded face of said moving member semi-circular groove;

a first ball bearing circulating passage in said moving member, said first ball bearing circulating passage communicating one part of said spirally threaded face of said moving member semi-circular groove with another part of said spirally threaded face of said moving member semi-circular groove for causing ball bearings in said first ball bearing circulating passage to move from said one part of said spirally threaded face of said moving member semi-circular groove to said other part of said spirally threaded face of said moving member semi-circular groove when said threaded ball screw shaft is rotated for linearly moving said moving member relative to said track member; and

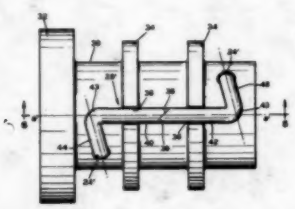
a first plurality of ball bearings disposed in said first ball bearing circulating passage, between said spiral thread on the outer surface of said threaded ball screw shaft and said spirally threaded face of said moving member semi-circular groove, and between said spiral thread on the outer surface of said threaded ball screw shaft and said substantially smooth surface of said semi-circular groove of said track member.

4,953,419

BALL SCREW RETURN SYSTEM

Theodore R. Schlenker, Troy, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 19, 1989, Ser. No. 409,549
Int. Cl.[5] F16H *25/22*
U.S. Cl. 74—459 **3 Claims**



1. In a ball screw assembly including an axially extending elongated screw, said screw defining an exterior helical groove, said assembly including a nut adapted for axial movement along said screw, said nut defining an interior mating helical groove, said assembly further including a plurality of ball bearings adapted to traverse a helical path in said nut between the grooves of said nut and said screw from one end of said nut to the other, said nut containing a pair of spaced apertures extending transversely to said screw, each aperture extending from said interior mating groove to the exterior of said nut, and a ball bearing return tube secured to said nut to provide recirculation of said ball bearings from one of said apertures to the other, said tube engaging said spaced transverse apertures; an improvement comprising: (a) each of said apertures in said nut is oriented parallel to the helix angle of the mating groove in said nut and tangent to said mating groove, and (b) said ball return tube comprises first and second members, each member having a major leg and a minor leg integrally joined together, each minor leg engaging one of said transverse apertures of said nut, wherein said major legs are positioned over the exterior of said nut in an axially aligned relationship, each of said minor legs forming an acute angle to its respective major leg, wherein said apertures comprise counterbores sized for receiving said minor legs, wherein said minor legs provide passage of said balls (a) tangent to said helical groove in said nut, and (b) parallel to the helix angle of said mating groove in said nut, wherein the centerlines of said major and minor legs of said first member of said return tube lie in a first plane, wherein the centerlines of said major and minor legs of said second member lie in a second plane, wherein said first and second planes are separate and distinct, wherein the centerlines of said major legs, and the axes of said nut and said screw are all parallel and lie in a third plane, wherein center-

lines of said minor legs intersect but lie outside of said third plane, wherein said first and second planes intersect said third plane along a line coincident with the centerline of said major legs, wherein said first and second planes form equal but opposite angles with said third plane, wherein said acute angle between said major and minor legs is equal to ninety degrees minus the helix angle of said mating groove in said nut, wherein each of said minor legs is integrally coupled to a major leg by an elbow, and wherein said nut comprises a pair of axially paced circumferentially extending flanges positioned intermediately along said nut, said flanges having slots adapted to accommodate said major legs.

4,953,420

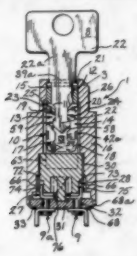
KEY LOCK APPARATUS

Larry J. Krubsack, Colgate; John G. Lawton, Milwaukee, and Allen L. Handy, North Prairie, all of Wis., assignors to Clum Manufacturing Company, Inc., Hartland, Wis.

Filed Sep. 29, 1989, Ser. No. 414,914

Int. Cl.[5] **E05B** *29/06*

U.S. Cl. 70—366 **22 Claims**



1. A keylock unit, comprising a housing having an internal bore, a rotating lock assembly mounted within said bore,

said rotating lock assembly including a locking member rotatably mounted within said bore, said locking member having a longitudinal opening extending parallel to the axis of rotation of the locking member and a locking wall fixed within the bore of said housing, said longitudinal opening extending transversely to said locking wall,

a locking element movably mounted within said longitudinal opening and having a lock portion and a control portion oppositely movable with respect to said locking wall and movable transversely into locking engagement with said locking wall, said locking element having a pivot support engaging locking member, a resilient means holding said pivot support in said engagement with said locking member and permitting movement of said control element relative to said locking wall and establishing opposite movement of said lock portion and said control portion relative to said locking wall, said housing having a key opening aligned with said longitudinal opening for receiving of a key having an elongated portion for insertion into said lock assembly and having a central portion edge aligned with said opening and thereby aligned with said control portion, said key having an enlarged end portion adapted to engage said control portion to position the control portion into engagement with said locking wall and thereby simultaneously move said lock portion from said locking wall and having a second portion immediately adjacent said enlarged portion to move the control portion and the lock portion in spaced relation to said locking wall and thereby permitting rotation of the lock assembly.

4,953,421

POWER-TRANSMISSION JOINT

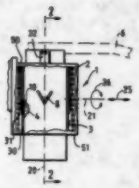
Michael Engel, Neuendorf; Karl-Heinz Pepping, Schleiden, and Gunther Gebhardt, Stadtkyll, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 305,387

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1988, 3806522

Int. Cl.[5] **G05G** *1/04*

U.S. Cl. 74—523 **5 Claims**



1. A power-transmission joint for a manual transmission for insertion intermediate a drive shaft of said transmission of a shift rod forming a universal joint, comprising a cage; a sliding block fixed in said cage for the receipt of a steering journal, said cage forming a frame having a rectangular cut-out portion, said sliding block having a box-like shape with a central bore therethrough in conformanace with said cut-out portions; retaining means for retaining said sliding block along the perimetrical sides thereof for pivoting without play within a pivoting plane about a predetermined axis and including unhindered paths in the direction of displacement for said sliding block for a defined floating movement thereof and a rubber-elastic shock absorber means positioned between said cage and said sliding block.

4,953,422

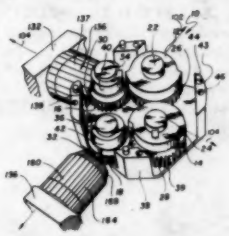
COMPOUND ANGLE LIMITING DEVICE

William L. Chapman; Charles F. Marner; Daniel K. Schotter, all of Tucson, Ariz., and Ronald L. Hehn, Euless, Tex., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 28, 1988, Ser. No. 174,055

Int. Cl.[5] **G05G** *5/04;* **F16M** *11/12;* **H01Q** *3/08*

U.S. Cl. 74—526 **19 Claims**



1. A compound angle limiting device for limiting the movement of a mass within first and second prescribed angular ranges about first and second axes respectively comprising:

first means mechanically coupled to said mass for sensing movement of said mass about said first axis;

second means mechanically coupled to said mass for sensing movement of said mass about said second axis;

a first cam mechanically coupled to said first means and movable in response to thereto; and

a second cam mechanically coupled to said second means and movable in response thereto;

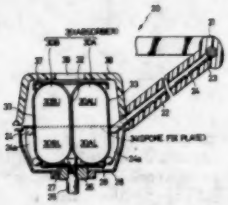
said first and second cams mounted for physical contact at at least one point to limit the compound angular excursion of said mass via said first and second means.

4,953,423

STEERING WHEEL WITH SHOCK ABSORBER

Kouzo Maeda, Yokohama; Masanobu Yoshioka, and Makoto Hikone, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 8, 1989, Ser. No. 363,186
Claims priority, application Japan, Jun. 9, 1988, 63-76818[U]; Feb. 28, 1989, 148754; Mar. 10, 1989, 159279
Int. Cl.[5] B62D 1/11
U.S. Cl. 74—552 26 Claims



1. A steering wheel provided with a shock absorber, comprising:

(a) a steering wheel including a rim, a cover pad, and at least one spoke extending from said rim to under said cover pad;

(b) shock absorbing means disposed under said cover pad; and

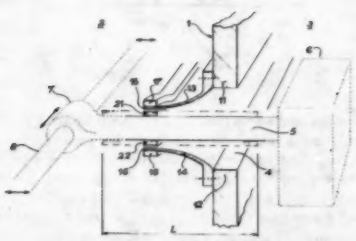
(c) connecting means for connecting a radially inner end of said spoke to a roughly middle peripheral surface of said shock absorbing means so as to divide said shock absorbing means into a lower shock absorbing portion for mainly absorbing a shock applied to said rim in dependence upon shearing deformation thereof and an upper shock absorbing portion for mainly absorbing a shock applied to said cover pad in dependence upon compressive deformation thereof.

4,953,424

DEVICE FOR COMMUNICATING BETWEEN TWO MEDIA SEPARATED BY A SLOTTED WALL

Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 22, 1989, Ser. No. 313,715
Claims priority, application France, Mar. 2, 1988, 88 02636
Int. Cl.[5] G05G 1/00; A44B 21/00
U.S. Cl. 74—566 4 Claims



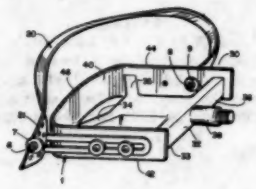
1. Device comprising a wall (1) separating two media (2, 3), the wall having a slot (4) through which passes an arm (5), the slot being provided with a packing constituted by two lips (13, 14) fixed to the wall and each lip having an edge (15, 16) provided with magnets (17, 18), the edges facing one another and the magnets of the edges attracting each other to join the edges together and close the slot, wherein the arm is provided with magnets (21, 22) moving away the magnets of the edges in order to locally separate the lips around the arm, a clearance (23) extending between the arm and the lips.

4,953,425

BICYCLE PEDAL ATTACHMENT

Darek Barefoot, 2183 Tovar Ct., Grand Junction, Colo. 81503

Filed Oct. 12, 1989, Ser. No. 420,301
Int. Cl.[5] G05G 1/14
U.S. Cl. 74—534.6 3 Claims



1. The combination of a bicycle pedal and a foot attachment assembly comprising:

a bicycle pedal having a body having a front end, a rear end, an outer side and an inner side, said front end and said rear end being substantially parallel to each other, said outer side and said inner side being substantially parallel to each other;

a spindle extends transversely from said inner side and it is externally threaded;

a single elongated strap having a front end and a rear end;

means for detachably securing the front end of said strap to said bicycle pedal at a point adjacent the intersection of its front end and its outer side;

means for detachably securing the rear end of said strap to said bicycle pedal at a point adjacent the intersection of its rear end and its inner side; and

the above structure forms a closed arched loop into which a bicyclist can first insert his foot from the outer side of the bicycle pedal and then by rotating his heel inwardly cause his foot to be captured for as long as desired wherein said means for detachably securing the front end of said strap comprises at least one aperture adjacent the front end of said strap, an elongated bracket having an inner end and an outer end, a stud means extends transversely from said outer end and through the aperture adjacent the front end of said strap.

4,953,426

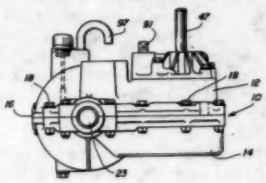
HOUSING SUPPORT FOR HYDRAULIC DISPLACEMENT UNIT SWASHPLATE

Alan W. Johnson, Ames, Iowa, assignor to Sauer-Sundstrand Company, Ames, Iowa

Filed Mar. 3, 1989, Ser. No. 318,731
Int. Cl.[5] F16H 57/02
U.S. Cl. 74—606 R 11 Claims

1. In combination, a hydraulic displacement unit having a swashplate and a two-part housing therefor, a drive output shaft extending from said unit, said two-part housing having a split line between housing parts with said drive output shaft centerline being located in the plane coincident with said split line, said swashplate extending across said split line, and means on one housing part only providing the only support for the

swashplate relative to hydraulic forces imposed thereon including means for providing support integral with said one



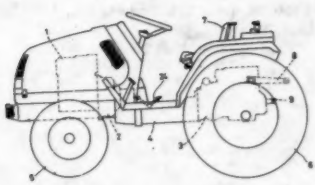
housing part and which extends across the split line between housing parts.

4,953,427

VEHICLE SPEED CONTROL SYSTEM

Kenzo Ushiro, Sakai, Japan, assignor to Kubota Ltd., Japan

Filed Aug. 28, 1989, Ser. No. 399,170
Claims priority, application Japan, Aug. 31, 1988, 63-218859
Int. Cl.[5] B60K *41/12*
U.S. Cl. 74—872 4 Claims



1. A speed control system for a vehicle having an engine, a stepless change speed device for receiving output of the engine, and an auxiliary change speed device for transmitting output of the stepless change speed device in a plurality of speeds to rear wheels, said speed control system comprising;

a speed governor for controlling rotational rate of the engine,

an accelerator lever for operating said speed governor,

interlocking means for interlocking said speed governor and said stepless change speed device such that the rotational rate of the engine is increased with an accelerating operation of said stepless change speed device through said speed governor, and is decreased with a decelerating operation of said stepless change speed device through said speed governor, and

interlock breaker means for prohibiting said interlocking means from interlocking said speed governor and said stepless change speed device when said auxiliary change speed device is in a low speed state.

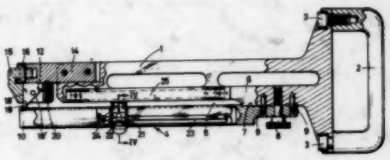
4,953,428

TOOL FOR STRIPPING CABLES, IN PARTICULAR CONSTITUTED CABLES

Bernard Commes, Saint Médard d'Eyrans, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 18, 1989, Ser. No. 452,759
Claims priority, application France, Dec. 22, 1988, 88 16999
Int. Cl.[5] H02G *1/12*
U.S. Cl. 81—9.4 13 Claims

1. Tool for stripping a cable having at least one conductor and an outer sheath, said tool comprising a tubular element having a wall defining a bore having an opening for receiving said at least one conductor and causing said tubular element to penetrate between said at least one conductor and said outer sheath, orientable cutting means, means for feeding said cable along said tubular element, said wall of said tubular element having a first end portion and a second end portion opposed to said first end portion, an aperture provided in the thickness of the wall of said first end portion of said tubular element, a support of elongated shape, said tubular element being held in such position by said second end portion of said tubular element on said support as to extend substantially parallel to said



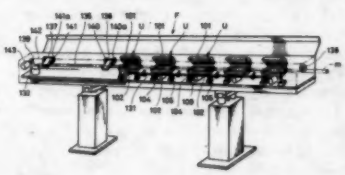
support and in the same direction as said support from said second end portion and define a gap therebetween and the support, said cutting means closing an end of said gap adjacent to said first end portion, said cutting means being mounted on said support adjacent to said first end portion of the tubular element and engaged in said aperture without projecting into said bore of said tubular element.

4,953,429

APPARATUS FOR ROTATABLY SUPPORTING AND FEEDING ELONGATED ROD MEMBER

Tomokichi Arisaka, and Mitsuyoshi Yamaguchi, both of Nagano, Japan, assignors to Kabushiki Kaisha ALPS TOOL, Japan

Division of Ser. No. 112,094, Oct. 21, 1987. This application Sep. 15, 1989, Ser. No. 408,146
Claims priority, application Japan, Oct. 24, 1986, 61-253271; May 28, 1987, 62-129946
Int. Cl.[5] B23B *5/14*
U.S. Cl. 82—127 6 Claims



1. An elongated rod member supporting apparatus provided in a rod feeding machine having a frame for feeding and rotatably supporting said elongated rod member to a working machine, said apparatus comprising:

a plurality of rod supporting units each positioned spaced away and arranged along a length of said rod feeding machine, each of said rod supporting units having both axial end portions provided with bearing portions for rotatably supporting said elongated rod member;

damper means provided between each of said rod supporting units and said frame for elastically supporting said rod supporting units;

means for supplying oil to each space defined between said bearing portions and said elongated rod member;

each of said rod supporting units comprising a bushing support for internally supporting said bearing portions, said bushing support being supported by said damper means;

each of said rod supporting units comprising an upper body and a lower body, said upper and lower bodies having semi-cylindrical shape and said upper body being pivotably supported to said lower body for providing an open space above said lower body upon opening of said upper body.

4,953,430

SEVERED ADHESIVE TAPE SUPPLYING DEVICE

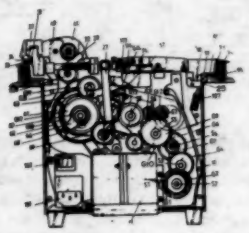
Myeon K. Hong, 21-88, Haweolgok-dong, Seongbuk-ku, Seoul, Rep. of Korea

Filed Dec. 8, 1988, Ser. No. 281,396

Claims priority, application Rep. of Korea, Dec. 8, 1987, 87-13960

Int. Cl.[5] B26D *5/20*

U.S. Cl. 83—155 6 Claims



1. An adhesive tape cutting and supplying apparatus comprising:

means for delivering adhesive tape including:

a pinion gear and a rack gear being geared together, said rack gear being in gearing-coaxial relationship with a first spur gear,

a second plurality of spur gears which are disposed in gearing relationship with each other and said first spur gear,

a third pair of spur gears disposed in side-by-side relationship,

a fourth pair of spur gears having opposite engaging surfaces, said fourth spur gears being coaxially connected to said second plurality of gears so that upon their rotation, they alternately engage said third pair of gears,

a fifth spur gear being in gearing relationship with said third pair of spur gears,

a sixth pair of coaxially disposed spur gears being in gearing relationship with said fifth spur gear,

a seventh spur gear being in gearing relationship with one of said pair of sixth spur gears, said seventh spur gear having a coaxial eighth spur gear and a coaxial ninth spur gear disposed at both sides thereof,

an adjustable member extending from a plate spring disposed in a ring member which is disposed between said seventh spur gear and said ninth spur gear, said adjustable member being connected to a support frame attached to a first separate spur gear which is in gearing relationship with a second separate spur gear, said second separate spur gear connected to a tape drawing length adjusting dial through a shaft,

a tenth spur gear being in gearing relationship with said ninth spur gear,

an eleventh spur gear being in gearing relationship with said tenth spur gear, and

a belt pulley coaxially connected to said eleventh spur gear, said belt pulley being in rotatable engagement with a drawing roller by gearing relationship therewith through engaging spur gears disposed at respective ends thereof, a first belt assembly provided on said belt pulley and a first small diameter belt pulley, and a second belt assembly provided on said first small diameter belt pulley and a second small diameter belt pulley, said second small diameter belt pulley being in rotatable engagement with a guide roller,

means for cutting said adhesive tape including:

a twelveth spur gear being in gearing relationship with said eighth spur gear,

a vertical rod fastened to one side of said twelveth spur gear, said vertical rod holding a rod connecting lever, and

a scissor shaft disposed within an aperture on a shaft installing frame and attached to said rod connecting lever which is connected to a scissor installing frame, said scissor installing frame provided with a pair of scissors and a tape drawing member, and

means for supplying said adhesive tape including:

a thirteenth spur gear being in gearing relationship with said eighth spur gear, and

a rod member fastened to one side of said thirteenth spur gear, said rod member connected to a ratchet installing frame containing a ratchet member for intermittently engaging with a ratchet gear so as to rotate a tape supply ring.

4,953,431

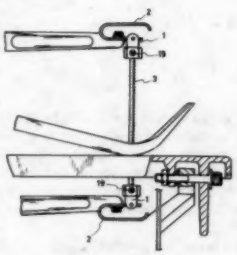
SAW BLADE SUSPENSION DEVICE

Ruey-Zon Chen, 18, Lane 144, Tucheng Rd., Tali Hsiang, Taichung Hsien, Taiwan

Filed Nov. 28, 1988, Ser. No. 276,625

Int. Cl.[5] B27B *19/02*

U.S. Cl. 83—781 3 Claims



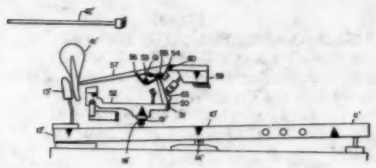
1. A saw blade suspension device for a scroll saw, comprising a saw blade (3) having a pair of end portions means for supporting the saw blade (3) at both end portions thereof, said means comprising an upper body and a lower body (1), each of said upper and lower bodies having a pair of ears (12) protruding outwardly, each of said upper and lower bodies having a bottom portion (13), a pair of holes (14,17) located in the front and rear of said bottom portion, a second pair of holes (15,16) located in the left and right side of said bottom portion, a steel pin (11) inserted in said ears of each body through apertures (121, 122) formed in said ears, the saw blade (3) being inserted in said first pair of holes (14, 17) located in the front and the rear of said bottom portion or in the second pair of said holes (15,16) located in the left and right side of said bottom portion, each body (1) having a hole (18) in the center of the bottom portion, the holes of said first pair (14,17) and the holes of said second pair (15, 16) intersecting said hole (18) located in the center of the bottom portion, said saw blade being held in said holes (18) located in the center of said bottom portion of each of said bodies and being locked by screws (19), a pair of clamping sheets (2) engaging said ears for clipping said steel pin, each of said clamping sheets having a front a plate (21) with a protruberance (22), said plate (21) having a width equal to the distance between said two ears (12), said pin (11) being clipped by said clipping plate (21).

4,953,433

ACTION FOR GRAND PIANO

Darrell G. Fandrich, 210 Third Ave., S., Seattle, Wash. 98104, and Chris A. Trevelas, 222 NW. 49th, Seattle, Wash. 98107

Filed Oct. 16, 1989, Ser. No. 421,374
Int. Cl.[5] G10C *3/18*
U.S. Cl. 84—239 **2 Claims**



1. In combination, a grand piano and an action for said grand piano, said grand piano having a basic structure, said basic structure comprising a hammer rail, said action comprising:

a driving apparatus,

a driven apparatus,

interconnection apparatus and

a jack actuating button attached to said hammer rail,

said action having an at-rest condition,

said driving apparatus comprising:

a key having a playing end and a working end and being supported on a key fulcrum between said playing and working ends, said key fulcrum being attached to said basic structure,

whereby said action is activated by application of force to said played end of said key by a player,

said action further comprising:

a wippen lever having a pivoted end and a free end, said pivoted end being pivoted to said fixed structure, said wippen lever further comprising a wippen butt positioned between said pivoted and free ends of said wippen lever,

said key further comprising an upper surface and a wippen fulcrum attached to said upper surface and positioned to contact said wippen butt whereby said wippen is supported by said wippen fulcrum,

said driven apparatus comprising:

a hammer assembly, said hammer assembly further comprising:

a shank having a pivoted end,

a head and

a hammer butt attached to said shank and having a cam surface,

a hammer assembly pivot,

said pivoted end of said shank being pivoted to said hammer rail by said hammer assembly pivot,

said key, wippen lever and shank having long dimensions, said key, wippen lever and shank being positioned with said long dimensions essentially horizontal such that the forces of gravity on said key, wippen lever and hammer assembly tend to return said action to said at-rest condition.

said interconnecting apparatus comprising in combination:

a jack having a pivoted end and a free end, a cam side and a jack cam on said cam side between said pivoted end and said free end of said jack, said pivoted end of said jack being pivoted to said free end of said wippen lever and extending generally upward with said free end of said jack contacting, in said at-rest condition, said cam surface on said hammer butt to support said hammer assembly, said jack cam having a surface and being positioned such that said surface of said jack cam contacts said jack actuating button and

a safety pin type compression spring having first and second ends, said first end being pivoted on said shank of said hammer assembly, said second end being pivoted on said free end of said jack, said spring having a line of action at a variable lever arm distance from said hammer assembly pivot and applying a force to said free end of said jack and an equal and opposite force to said hammer shank,

whereby when said player applies said force to said playing end of said key and said playing end of said key is depressed, said action moves out of said at-rest condition and said key rocks on said fulcrum to raise said wippen fulcrum which raises said wippen lever, lifting said jack whereby said jack cam cooperates with said jack actuating button and said jack is pivoted toward said pivoted end of said wippen lever and said free end of said jack moves along said cam surface on said hammer butt, said jack cam and said cam surface on said hammer butt being contoured such that as said jack cam moves past said jack actuating button and said free end of said jack moves along said cam surface of said hammer butt, said jack cam stays in contact with said jack actuating button under said force applied by said repetition spring to said free end of said jack and said free end breaks contact with said cam surface on said hammer butt, remains in close proximity to said surface and said equal and opposite force applied by said repetition spring supports said hammer assembly,

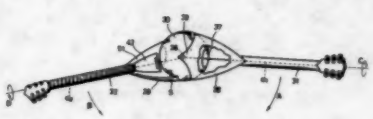
and further whereby when said force applied to said playing end of said key is reduced and said action begins to return to said at-rest condition due to the force of gravity on said apparatuses and to said forces applied by said repetition spring, said free end of said jack is in position to contact and support said hammer assembly if said force applied to said playing end is increased.

4,953,434

STRINGED MUSICAL INSTRUMENT THAT CAN BE PLAYED BY TWO MUSICIANS SIMULTANEOUSLY

Paul A. Guss, P.O. Box 15204, Arlington, Va. 22215-0204

Filed Aug. 29, 1989, Ser. No. 399,955
Int. Cl.[5] G10D *1/00*
U.S. Cl. 84—263 **17 Claims**



1. A stringed musical instrument comprising:

two instrument bodies; and

two necks, wherein a longitudinal axis along a first neck defines a first axis and a longitudinal axis along a second neck defines a second axis; and

means for joining and for positioning said instrument bodies and said necks such that said first and second axis substantially intersect with a common vertex located between said instrument bodies and said first and second axes are at least angularly movable with respect to each other about said common vertex.

4,953,435

REAR-ACCESS TRUSSED NECK CONSTRUCTION FOR STRINGED MUSICAL INSTRUMENTS

Emmett H. Chapman, 6011 Woodlake Ave., Woodland Hills, Calif. 91367-3238

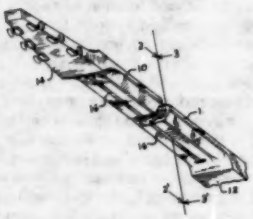
Filed Jan. 16, 1990, Ser. No. 466,072
Int. Cl.[5] G10D *3/00*
U.S. Cl. 84—293 **11 Claims**

1. An improved trussed neck construction, for a stringed musical instrument, comprising:

an elongated neck having a front side defining a fingerboard region and having at a rear side a rear surface configured with a longitudinal groove;

an elongated metallic truss disposed within said groove substantially flush with the rear surface;

anchoring means disposed at a first end of said truss, adapted to constrain said truss longitudinally relative to said neck; and



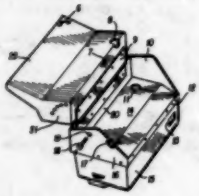
adjustment means, disposed at a second end of said truss and thus accessible from the rear side of the neck, comprising an adjustment part adapted to adjustably constrain said truss longitudinally relative to said neck.

4,953,436

FOLDING HOUSING FOR ELECTRONIC M.I.D.I. ACCORDION

Giorgio F. Curletto, 6109 Nevada Ave. NW., Washington, D.C. 20015

Filed Oct. 16, 1989, Ser. No. 422,757
Int. Cl.[5] G10D *11/00*
U.S. Cl. 84—376 A **1 Claim**



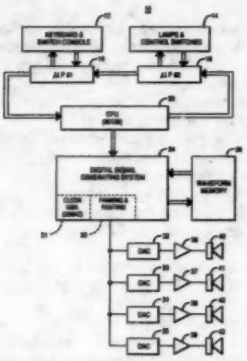
1. A folding housing for electronic M.I.D.I. accordion, said folding housing consisting of a complete electronic M.I.D.I. accordion bassboard housing, said bassboard housing being connected on one side by the extreme inner edges of its long front and back surfaces and its short top and bottom surfaces to a matching rectangular metal brace comprising a long wide frontal surface, an equally long but considerably narrower back surface, a short partially tapered top surface and a similarly short partially tapered bottom surface, and one electronic M.I.D.I. accordion keyboard extending, lengthwise, into a very short rectangular protuberance having a long narrow front surface, a long narrow back side, a short top end (containing a semicircular sequence of perforations) and a short bottom end and a long rectangular narrow side panel sealing the opening of said very short rectangular protuberance, said long rectangular narrow side panel of said electronic M.I.D.I. accordion keyboard's protuberance being connected, by means of a piano hinge, to the back side of said long wide frontal surface of said rectangular metal brace, said short partially tapered top surface of said rectangular metal brace having a thumb screw-like manual control interacting with said semicircular sequence of perforations to regulate the desired angle of two halves of the folding housing for electronic M.I.D.I. accordion, said short partially tapered top surface of said rectangular metal brace also containing one of the two attachments required by the single back strap and said keyboard housing's back surface having the second of said two attachments of said single back strap fastened to its lower right corner, the control panel being in the shape of a narrow single row of push buttons facing laterally rightward and merging longitudinally, on one side, with the outer edge of said long narrow front surface of said very short rectangular protuberance, and bordering lengthwise, on the opposite side, with the inner edge of said electronic M.I.D.I. keyboard.

4,953,437

METHOD AND APPARATUS FOR DIGITALLY GENERATING MUSICAL NOTES

David T. Starkey, San Diego, Calif., assignor to Gulbransen Incorporated, Las Vegas, Nev.

Filed Jan. 17, 1989, Ser. No. 297,887
Int. Cl.[5] G10H *1/057, 1/24, 7/06, 7/12*
U.S. Cl. 84—603 **5 Claims**



4. A digital signal generator for musical notes comprising:

digital computer means having first input means including a plurality of stops for selecting one of a set of harmonic structures, and second input means including a plurality of keys for producing selection signals each of which indicates the selection of a note having a predetermined pitch and one of the set of harmonic structures;

memory means for storing a first plurality of digital samples representing a waveform having the selected harmonic structure;

means for producing a completed sample output following a predetermined number of interpolation cycles, including a source of digital values representative of phase angle increments controlled by said digital computer means and responsive to a change in said selection signals for sampling the samples stored in said memory means at a fixed clocking rate for selecting a note, and further including interpolator means for repetitively interpolating between successive samples read from said waveform memory means and producing a plurality of completed sample outputs, each of which represents more accurately than does either of such successive samples a point on the stored waveform instructed by the selection signals, said interpolator means including a digital adder, having a first input connected to receive samples read from the waveform stored in said memory means, a first latch under clock control connected between the output and a second input of said adder for dividing an output sum signal by two and coupling the resulting signal to the second input of said adder, and a second latch connected to receive the output of said adder as the plurality of completed sample outputs; and

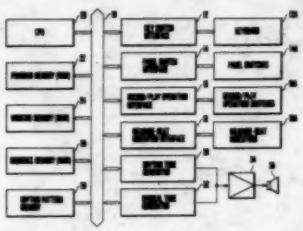
means for converting the plurality of completed sample outputs produced by said interpolator means into an analog output.

4,953,438

AUTOMATIC PERFORMANCE APPARATUS STORING AND EDITING PERFORMANCE INFORMATION

Takeo Shibukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 3, 1988, Ser. No. 152,025
Claims priority, application Japan, Feb. 6, 1987, 62-25682
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—609 6 Claims



1. An automatic performance apparatus for an electronic musical instrument, comprising:

input means for inputting music performance information;

a memory device having a plurality of addresses for storing music performance information input by the input means in plural music performance units of certain length each having not less than two notes;

write means for sequentially writing music performance information at the addresses of said memory device on the basis of an operation of said input means, wherein music performance information is written in said memory device to designate a start point for each music performance unit;

switching means for commanding rewriting; and

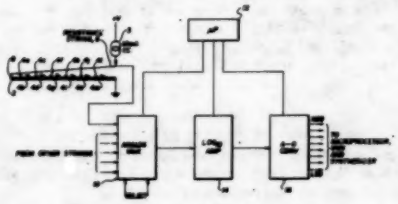
write control means, responsive to a command from said switching means, for returning said memory device to the start point of a predetermined music performance unit in accordance with music performance information written in said memory device designating said start point of said predetermined music performance unit.

4,953,439

ELECTRONIC MUSICAL INSTRUMENT WITH QUANTIZED RESISTANCE STRINGS

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corp., Salem, Mass.

Filed Jun. 26, 1987, Ser. No. 66,584
Int. Cl.[5] G10H *1/18, 5/00*
U.S. Cl. 84—655 12 Claims



1. In an electronic musical instrument of the stringed type, wherein the instrument includes a body and a fingerboard having conducting portions each connected to ground, the fingerboard being attached to a body and wherein the electronic instrument further comprises:

a plurality of spaced parallel resistance wire strings superposed over the fingerboard for completing respective electrical circuits when they contact said conducting portions;

means for electrically energizing said electrical circuits;

means for securing the strings in relative spaced relationship with respect to the fingerboard;

circuit means for ensuring that when at least one of the resistance strings is displaced toward the fingerboard and comes into contact with a conducting portion thereon for completing one of said electrical circuits, an analog voltage which has a magnitude which is dependent on the length of the string with respect to the contacted area and a reference point is generated, the length of the string representative of an effective electrical resistance; and

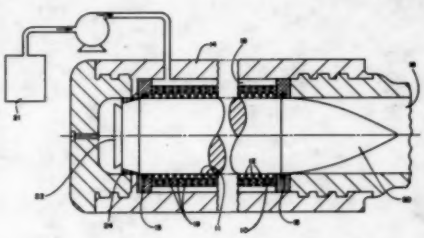
means for quantizing the generated analog voltage to a representative level which is determined by the magnitude of the voltage generated, the possible magnitudes which may be generated being divided into a plurality of first voltage magnitude ranges for each string and said means for quantizing being operative to quantize all voltage magnitudes within each range to the same level associated with such range, for minimizing undesired effects of resistance variations of the string due to contact resistance effect.

4,953,440

LIQUID MONOPROPELLANT GUN

William M. Moscrip, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 26, 1975, Ser. No. 636,342
Int. Cl.[5] F41F *1/04*
U.S. Cl. 89—7 6 Claims



1. A liquid monopropellant gun having a propellant lined breech when ready for firing comprising:

a gun tube;

a breech fixed to one end of said gun tube;

a plurality of annular combustion chambers formed on the interior wall of said breech, the interior wall of each of said combustion chambers being defined by the surface of a projectile introduced into said breech; and

means for introducing liquid monopropellant into said annular combustion chambers.

4,953,441

METHOD AND CONSTRUCTION FOR CONTROL OF CURRENT DISTRIBUTION IN RAILGUN ARMATURES

William F. Weldon; Herbert H. Woodson, and Glen C. Long, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 885,915, Jul. 15, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 203,556
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 8 Claims

1. An electromagnetic railgun comprising:

an electrical power supply;

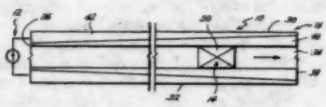
armature means having a leading edge and a trailing edge; and

rail means having a pair of spaced, juxtaposed rails defining

an elongated bore therebetween and operable for receiving the armature means along the length of the bore,

the rail means being operably connected to the power supply to provide a current flow path through one of the rails, through the armature means, and into the other rail to propel the armature means along the bore in the direction of the leading edge when power is supplied,

the rail means including a layer of low conductivity material placed along the length of the bore adjacent the



bore for permitting rapid current penetration between the armature and said low conductivity layer to inhibit the concentration of current density in the region of the trailing end of the armature means as the armature means is propelled along the bore, each layer of low conductivity material increasing in thickness along the length of the bore,

the rail means further including a layer of high conductivity material adjacent the layer of low conductivity material and spaced from the bore.

4,953,442

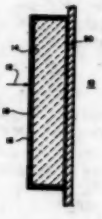
MAGNETIZED CERAMIC ARMOR SYSTEM

William A. Bartuski, Fayetteville, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Jan. 7, 1986, Ser. No. 816,823

Int. Cl.[5] F41H *5/02*

U.S. Cl. 89—36.02 **13 Claims**



1. Armor having high impact, penetration and breakage resistance and multiple hit capability comprising a relatively thick layer of ferrous ceramic material encapsulated in a relatively thin fiberglass layer said ferrous ceramic material being sufficiently magnetized so as to be capable of being magnetically attached to a non-magnetized metal surface.

4,953,443

DEVICE FOR THE ALIGNMENT OF AN AIMING AXIS BODY AT A TARGET POSITION

Ghert Meier, Stadel, Switzerland, assignor to Contraves AG, Zurich, Switzerland

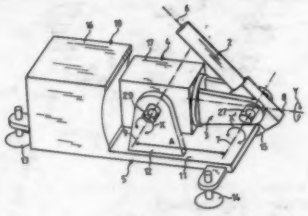
PCT No. PCT/CH87/00149, § 371 Date Aug. 9, 1988, § 102(e) Date Aug. 9, 1988, PCT Pub. No. WO88/03637, PCT Pub. Date May 19, 1988

PCT Filed Nov. 2, 1987, Ser. No. 224,776

Claims priority, application Switzerland, Nov. 3, 1986, 04347/86

Int. Cl.[5] F41G *3/02*

U.S. Cl. 89—41.02 **5 Claims**



1. A device for aiming an aiming axis body at a target, comprising:

an aiming axis body defining an aiming axis;

a first supporting body rotatably supporting said aiming axis body for rotation about a first rotational axis constituting a laying axis and extending substantially perpendicular to said aiming axis;

first drive means for rotating said aiming axis body about said laying axis;

a second supporting body rotatably supporting said first supporting body for rotation about a second rotational axis constituting a singularity axis and extending substantially perpendicular to said first rotational axis;

second drive means for rotating said first supporting body about said singularity axis;

said laying axis and said singularity axis conjointly defining a laying axis system;

a base body;

a bearing body stationarily supported at said base body;

said bearing body defining a top zone located at a predeterminate height above said base body;

said bearing body at said top zone rotatably supporting said second support body for rotation about a third rotational axis constituting a base axis and extending at a predeterminate spacing from said first rotational axis and substantially perpendicular to said singularity axis; and

third drive means for rotating said second supporting body and thereby said laying axis system defined by said laying axis and said singularity axis, at said top zone of said bearing body about said third rotational axis.

4,953,444

BRAKE SERVO BOOSTER

Philip Cunningham, Newport, and Stuart J. Briggs, Cwmbran, both of Great Britain, assignors to Lucas Industries public limited company, Birmingham, England

Filed Jan. 31, 1989, Ser. No. 304,245

Claims priority, application United Kingdom, Feb. 2, 1988, 8802297

Int. Cl.[5] F01B *25/26*

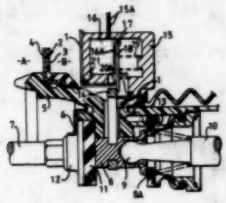
U.S. Cl. 91—1 **5 Claims**

1. A brake servo booster comprising:

a valve mechanism operable to control the supply of air to an integral or remote air-actuated servo piston, said valve mechanism including a valve element operatively con-

nected to a force input member and providing a valve seat for cooperation with a valve member,

a laterally extending abutment member carried by the valve element and being arranged so that an extreme position of movement of the valve element is determined by engagement of the abutment member with a fixed surface, and



switch means adapted for connection, in use, into an electrical circuit, said switch means being mounted in the vicinity of said valve element for actuation in response movement of said abutment member with the valve element.

4,953,445

CONTROL DEVICE WITH FAILURE DETECTION CENTERING FOR A DOUBLE-ACTING HYDRAULIC JACK

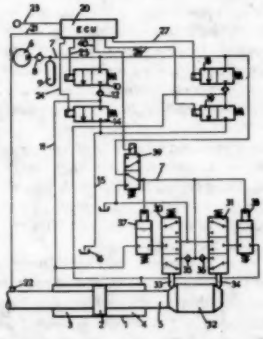
Gilbert Kervagoret, Argenteuil, and Christian Tanguy, Frepillon, both of France, assignors to Bendix France, Drancy, France

Filed Mar. 22, 1989, Ser. No. 326,956

Claims priority, application France, Mar. 25, 1988, 88 03911

Int. Cl.[5] F15B *13/16*

U.S. Cl. 91—358 A **11 Claims**



1. A control device for a double-acting hydraulic jack, comprising:

a distributor assembly controlling the selective connection of each of two chambers of the jack to one of a pressure source and a pressureless tank, said distributor assembly being controlled by an electronic control member,

a main circuit comprising means for isolating the chambers of the jack from the tank and from the pressure source in the event of failure of said source, with the result that a piston of the jack is immobilized in a position which it occupied before the failure, and an auxiliary circuit comprising means for selectively connecting one of the chambers to the pressure source and the other chamber to the tank,

the means being controlled by a sensor sensitive to the position of the piston of the jack so as to return the piston to a middle position, and being operated only when there is simultaneously a failure of the pressure source and an appropriate signal emitted by said control member.

4,953,446

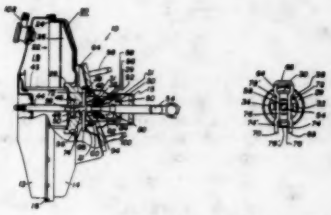
KEY MEMBER FOR RETAINING A CONTROL VALVE IN A HUB

Douglas A. Fecher, Granger, and Thomas E. Dodd, South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 14, 1989, Ser. No. 392,876

Int. Cl.[5] F15B *9/10*

U.S. Cl. 91—369.3 **7 Claims**



1. A key member located in a slot in a hub for retaining a plunger of a control valve in a bore of the hub, said hub being attached to a movable wall that separates the interior of front and rear shells into first and second chambers, said front and rear shells being joined together to define a housing for a servomotor, said plunger responding to an actuation force from an input member by initially moving from a lap position where the first and second chambers are isolated from each other and to an actuation position where the second chamber is connected to a source of fluid under pressure to develop a pressure differential across the movable wall, said pressure differential creating an output force in said wall corresponding to said input force, said plunger on termination of said actuation force engaging and moving said key member in said slot into engagement with said hub to establish a full release position for said control valve whereby said first and second chambers are connected to each other to allow the fluid pressure therein to equalize, said key member being characterized by a base section with parallel first and second legs that extend therefrom, each of said first and second legs having an arcuate section that projects inwardly toward the other leg and an end section, said arcuate section engaging said hub and a flange on said plunger engaging said arcuate section to establish said full release position while said base section and end sections engage said rear shell as the wall approaches the rear shell to hold the plunger stationary as said hub continues to move toward said rear shell, said arcuate section engaging said flange to locate said plunger in said lap position when the wall engages the rear shell.

4,953,447

VACUUM SUPPLY SYSTEM IN A MOTOR VEHICLE

Franz Bender, Wendlingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,915

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806916

Int. Cl.[5] F15B *11/00, 13/00*

U.S. Cl. 91—514 **20 Claims**

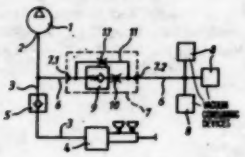
1. A vacuum supply system for a brake power assist unit in a motor vehicle, as well as for at least one additional vacuum consuming device comprising:

a main pipe being provided between a suction connection of a vacuum generating device and the brake power assist unit and having a first check valve therein;

a branch pipe branching off from the main pipe to the at least one additional consuming device and which is connected

between the suction connection and the first check valve and contains a second check valve therein;

the second check valve permits a suction flow from the at least one additional consuming device to the vacuum generating device;



a first flow control device fluidly connected in series with the second check valve;

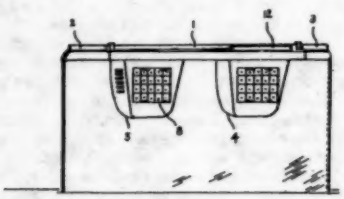
a bypass pipe having a second flow control device fluidly connected in parallel to the second check valve and the first flow control device.

4,953,448

APPARATUS OF HEAT PREVENTER OF A CAR

Gabri C. B. Duh, No. 267, Lane 376, Sec. 1, Kwang-fu Rd., Hsinchu, Taiwan

Filed Aug. 16, 1989, Ser. No. 394,722
Int. Cl.[5] B60H *1/24*
U.S. Cl. 98—2.02 **1 Claim**



1. An apparatus for ventilating the interior of a car, comprising:

a body having a U-shaped groove for receiving the upper edge of a car window, the body having tooth profiles at opposite ends thereof, the body having an outer panel with a curved shield and vent therein for communicating air outside of the car with air inside of the car, and an inner panel;

a pair of boxes connected to said inner panel for being positioned in a car, each box having a battery space at the bottom thereof for receiving at least one battery, and each box having a seat for receiving a motor and fan combination therein for connection to a battery for circulation of air, one of said boxes having a housing with a plurality of inlet vents and a plurality of outlet vents for receiving and discharging air through said housing of the one box for circulation of air within the car, the other box having a housing with inlet vents only, the housing of the other box being operatively connected to the curved shield and vent for discharging air from the interior of the other box outwardly through the curved shield and vent;

a motor and fan combination mounted in each of said boxes;

a switch connected to a side of each of said boxes and operatively connected to each respective motor and fan combination for activation thereof;

a solan panel connected over each box on a surface thereof facing said outer panel for receiving sunlight from outside of said car to energize batteries in said boxes; and

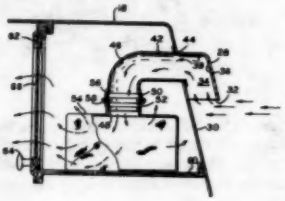
a pair of plates each having a tooth rack for engaging one of the tooth profiles at one end of said body, for varying the overall length of said body with said plates on an upper edge of the window of the car.

4,953,449

FILTERED POSITIVE VENTILATION SYSTEM FOR VEHICLE

Ernest E. Jackson, 4505 Lower Huntington Rd., Fort Wayne, Ind. 46809

Filed Jul. 5, 1989, Ser. No. 375,713
Int. Cl.[5] B60H *3/06*
U.S. Cl. 98—2.11 **9 Claims**



1. A filtered positive ventilation system for a vehicle for alleviating entry of dust therein comprising:

an air intake opening through a front wall of the motor vehicle, said intake opening being the only deliberate forward facing air permeable opening in the vehicle;

an air scoop connected to the front wall of the vehicle and communicating with said intake opening, said air scoop being arranged and configured to direct air impinging on the front wall of the motor vehicle due to forward motion thereof into said air intake opening, said air scoop including a front wall positioned in front of said intake opening, said air scoop including side and top walls for defining with the vehicle front wall a downwardly facing opening and air passage for guiding air to said intake opening;

conduit means disposed interiorly of said vehicle and communicating at one end exclusively with said intake opening;

air filter means disposed interiorly of said vehicle and communicating exclusively with the other end of said conduit means and being sealed thereto such that all air entering said vehicle through said intake opening necessarily passes through said air filter means, said air filter means including a hollow filter bag; and

a bulkhead located between said air filter means and the interior of the vehicle, said bulkhead including an outlet means, said air filter means including an elastic coupling means for readily removing and replacing said filter bag;

whereby positive air pressure is generated in the vehicle by forward motion thereof to prevent air and dust infiltration into the vehicle through incidental cracks and crevices, and whereby such air as is deliberately permitted into the vehicle is filtered of particulates.

4,953,450

CRAWL SPACE VENTILATOR SYSTEM

Paul D. Remondino, Spring Lake, Mich., assignor to Windward Products, Inc., Grand Haven, Mich.

Filed Sep. 6, 1989, Ser. No. 404,109
Int. Cl.[5] F24F *7/007*
U.S. Cl. 98—33.1 **14 Claims**

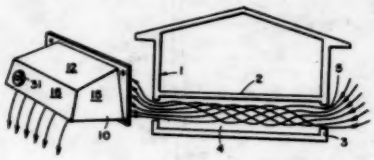
1. A system for venting the foundation of a building in which a space is provided below the floor of the building and the foundation surrounds such space comprising:

an inlet opening for admitting air into said space;

an exhaust opening for exhausting air from said space;

ventilating means for drawing air into said space through said inlet and exhausting air out of said space;

control means for controlling the operation of said ventilating means; and



means whereby said ventilating means is operated only after sundown and before sunrise.

4,953,451

VENTILATION DEVICE

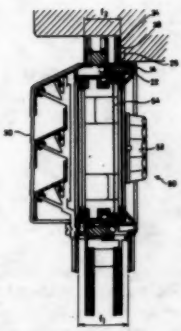
Willem D. Arbouw, Harderwijk, Netherlands, assignor to Aluart Aluminum B.V., Nieuwegein, Netherlands

Filed Nov. 3, 1989, Ser. No. 431,091

Claims priority, application Netherlands, Nov. 8, 1988, 8802740

Int. Cl.[5] E06B *7/02*

U.S. Cl. 98—98 **9 Claims**



1. A ventilation device comprising a rectangular frame having a barrier element and comprising a pair of spaced end parts to define sides of the frame, said frame further comprising a bottom side fitted between said end parts and shaped to receive an edge of a glass panel and an upper side fitted between said end parts, said upper side comprising a profiled strip which is L-shaped in cross-section and having a horizontal leg which is directed toward the room to be ventilated and an upright leg, said horizontal leg having a free end which merges into an upright edge which in turn merges into a first end edge directed towards said upright leg, a second end edge projecting at right angles from said upright leg toward said first end edge, said first and second end edges and said horizontal leg defining an accommodation space, and an inverted profiled T-section having a horizontal leg received within said accommodation space and further having an upright leg off set from the center of said horizontal leg.

4,953,452

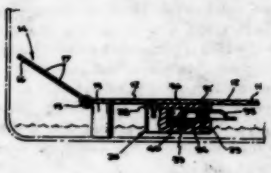
COLLAPSIBLE STEAMER BASKET

Kenneth A. Turlow, 138 Waterview, Playa del Rey, Calif. 90293

Filed Sep. 30, 1988, Ser. No. 252,175

Int. Cl.[5] A47J *27/212*

U.S. Cl. 99—344 **17 Claims**



1. A steamer basket comprising:

a base plate having a plurality of spaced openings therein;

a plurality of overlapping leaves pivotally connected to said base plate, each of said leaves having a plurality of spaced openings therein and interconnecting means between each of said leaves and said base plate for retaining each of said leaves and said base plate for retaining said leaves in a first fixed position at an angle with respect to the horizontal and allowing said leaves to pivot to a second position inwardly toward said base plate; and

audible signal means associated with said base plate for providing an audible signal when the temperature encountered at said base plate exceeds a predetermined temperature, said audible signal means including a housing mounted to the underside of said base plate, said housing having an inner bell-shaped chamber with a cymbal resiliently mounted therein and a striker mounted in said housing for striking said cymbal when said predetermined temperature is exceeded, said cymbal having a bell-shaped portion with a flat annular ring, said ring extending out of said housing through an opening communicating with said bell-shaped chamber.

4,953,453

APPARATUS FOR OPERATING LOCKS OF BAKING TONGS FOR PRODUCING ROTTABLE, PREFERABLY EDIBLE WAFERS FROM WAFER DOUGH IN A WAFER BAKING OVEN OR AN AUTOMATIC WAFER BAKING MACHINE

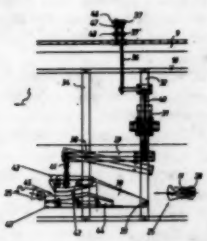
Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 17, 1989, Ser. No. 422,584

Claims priority, application Austria, Oct. 20, 1988, 2597/88

Int. Cl.[5] A21B *5/02*

U.S. Cl. 99—373 **12 Claims**



1. In a wafer baking oven comprising

an oven structure defining an oven space,

a series of wafer baking tongs, each of which is movable between an open position and a closed position and is provided with a lock, which is movable between an unlocking position, in which said lock permits said tongs to be moved from said closed position to said open position, and a locking position, in which said lock is adapted to lock said tongs in said closed position,

each of said tongs also comprising a movable actuating member, which is coupled to said lock and is operable in a locking sense to move said lock from said unlocking position to said locking position and in an unlocking sense to move said lock from said locking position to said unlocking position, and is arranged to assume a predetermined final position when said lock is in said locking position of said lock,

said oven also comprising tong drive means for moving said series of tongs in succession in a predetermined direction of travel along a predetermined endless path extending in said oven space,

said oven also comprising an operating apparatus, which is mounted on said oven structure at a stationary location adjacent to said path and comprises a closing element, which is movable to and from a predetermined operative position and in said operative position is arranged to engage said actuating member of each of said tongs as said tongs move past said location and to operate said actuating member in said locking sense, and

biasing means urging said closing element to said operative position, wherein

said closing element engaging said actuating member is arranged to be pushed back from said operative position against the action of said biasing means when the movement of said actuating member in said locking sense has been stopped before said lock has reached said locking position as said tongs move past said predetermined location,

the improvement residing in that

said operating apparatus comprises an unlocking element, which is movable from a position of rest to an engaging position and in said engaging position is arranged to engage said actuating member when said closing member has pushed back at least a predetermined distance from said operative position, and to move said actuating member in said unlocking sense so as to move said lock to said unlocking position, and

an actuator, which is operable to move said unlocking element to said engaging position when said closing element has been pushed back by said actuating member at least said predetermined distance from said operative position.

4,953,454

STEAM CHAMBER

Merle V. Liere, R.R. 2, Colton, S. Dak. 57018

Filed Dec. 7, 1988, Ser. No. 280,929

Int. Cl.[5] A23L *1/ 01*

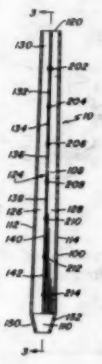
U.S. Cl. 99—426 **6 Claims**

1. An apparatus adapted to be connected to a steam source for steaming materials therein, said apparatus comprising:

chamber means for receiving and passing therethrough said material to be steamed, said chamber means being comprised of an upper chamber and a lower chamber, said upper chamber having a top and a bottom and being wider at said bottom than at said top;

planar partitioning means within said upper chamber for partitioning said upper chamber into at least two compartments, said compartments being substantially unobstructed an increasing in cross sectional area along the length thereof; and

steam means adapted to be connected to said steam source and positioned at spaced intervals between said top and



said bottom of said upper chamber for delivering steam into said compartments within said upper chamber.

4,953,455

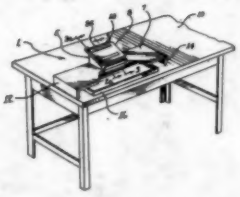
FOOD WRAPPER APPARATUS

Rosalino Figueras, and George Micko, both of Springfield, Ill., assignors to EFG Foods, Inc., Springfield, Ill.

Continuation-in-part of Ser. No. 101,105, Sep. 25, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 163,241

Int. Cl.[5] A21C *9/00*; A23P *1/00*

U.S. Cl. 99—450.6 **13 Claims**



1. A food wrapper apparatus, comprising:

a base means for mounting onto a work table;

a support member means for mounting onto said base means;

an upper member means for mounting onto said support member means;

a roller means for rolling on said support member means and for enclosing food with a food wrapping material entirely on said support member means; and

at least one cutting means operably coupled to said base means for cutting wrapped food into multiple pieces.

4,953,456

TOOL HOLDER FOR A PICKLING MACHINE AND TOOL COMBINATION FOR USE IN SUCH A HOLDER

Otto Prosenbauer, Innstrasse 23, A-1201 Wien, Austria

PCT No. PCT/AT87/00066, § 371 Date May 19, 1989, § 102(e) Date May 19, 1989, PCT Pub. No. WO88/03758, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 13, 1987, Ser. No. 359,654

Int. Cl.[5] A23B *4/02*; A22C *9/00*

U.S. Cl. 99—533 **12 Claims**

1. Tool holder for a pickling machine comprising a pricking

frame having at least one row of take-up means is provided equal to each other and each including a brine supply line;

take-up means tools selectively affixed to said brine supply line at a chosen position, said take-up means tools being different from each other and including pickling needles having brine channels formed therein, each tool having a connection head tightly connected to said take-up means;

each said connection head fitting into said take-up means, and including a connection channel for the brine supply to each pickling needle, said connection channels being connected to said brine supply line;

said connection heads being disposed at said chosen position, said connection heads including a bottom and combinations of one or more knives and, needles disposed on said bottoms;

each connecting head having means for plugging to said take-up means and openings for the stream of the brine only for the needles carried by the connection head, said take-up means being closed with respect to the brine supply line for the knives; and

a pull-off safety measure for the connection head, engaging the connection head from below and having slots entered by the needles or knives, respectively.

4,953,457

METHOD AND A CONTINUOUS CYCLE COMPACTOR-APPARATUS, INCLUDING A CIRCULATING FORCED AIR PRE-CHAMBER FOR TREATING BIODEGRADABLE SOLID URBAN WASTE MATERIALS AND FOR SEPARATING AND RECYCLING THE NON-BIODEGRADABLE COMPONENTS THEREOF

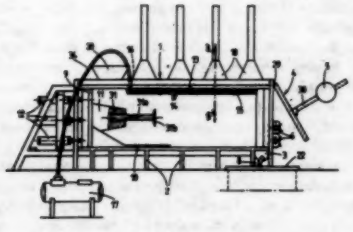
Liborio Campo, Via Monte Grappa 58, 91011 Alcamo, Italy

Filed Mar. 14, 1989, Ser. No. 323,331

Claims priority, application Italy, Mar. 14, 1988, 86201 A/88

Int. Cl.[5] B30B *9/02, 9/00, 9/06*

U.S. Cl. 100—37 **3 Claims**



1. A method for treating biodegradable solid urban waste materials and for separating and recycle of non-degradable waste materials, comprising:

feeding said waste materials into a substantially closed but ventilated tubular room, of a variable volume, into which compressed air is conveyed;

compressing said waste material in said room to a predetermined degree;

removing biogas produced therein through a plurality of pipes, and passing and filtering said gas through hydraulic siphon filters;

removing percolate obtained in the compression step, and partially recycling the percolate into the treatment room, for moistening the compressed mass; and

discharging solid non-biodegradable material using kneading means for the treated compressed waste material mass.

4,953,458

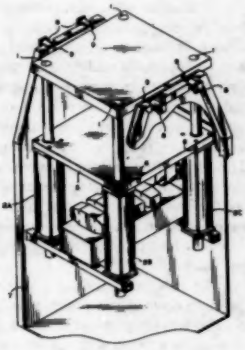
MULTI-ACTUATOR HYDRAULIC PRESS

Charles L. Day, P.O. Box 1097, Days Mills Rd., Kennebunk, Me. 04043

Filed Mar. 13, 1989, Ser. No. 322,531

Int. Cl.[5] B30B *1/34*

U.S. Cl. 100—269 R **18 Claims**



1. A hydraulic press comprising:

a pair of platens defining a work area therebetween;

a plurality of pairs of like double-acting hydraulic actuators, each actuator interconnecting the platens to provide an actuating force to change the spacing between the platens, each said pair of actuators being disposed symmetrically about said work area whereby upon actuation of at least a said pair of actuators in unison a force is created acting along an axis passing through said work area with all said pairs of actuators, when acting in unison, producing an actuating force along the same said axis, and

a control means associated with said hydraulic press and interconnecting said pairs of actuators with hydraulic fluid for controlling a supply of the hydraulic fluid under pressure to the actuators so that, in a first operating mode, a said first pair of said actuators function in series to provide a first rate of change of said spacing, in a second mode, at least said first pair of actuators function in parallel to provide a second rate of change of said spacing which is less than the rate of change of the first mode and, in a third mode, at least said first pair of actuators function in accordance with said second mode while simultaneously a second pair of said actuators function in parallel with said first pair of actuators thereby to provide a maximum actuating force of which first and second pairs of said actuators together are capable for that fluid supply.

4,953,459

METHOD FOR POSITIONING MATERIAL IN A PLURALITY OF PRINTING POSITIONS FOR MULTI-COLOR SILKSCREEN PRINTING

Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Sweden

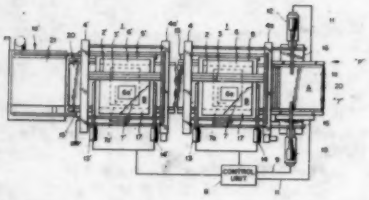
Filed Aug. 29, 1988, Ser. No. 237,703

Claims priority, application Sweden, Sep. 23, 1987, 8703669

The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.

Int. Cl.[5] B41F *15/10*

U.S. Cl. 101—115 **15 Claims**



1. A method in multi-color silkscreen printers which incorporate a multiple of printing stations, for positioning in each of the printing stations in relation to print material a second print pattern which is to be applied to said print material and which derives from a first print pattern carried by a stencil, such that respective second print patterns will take a pre-determined position or location relative to said print material, in which method the second pattern is applied by causing coating substance to pass through the first pattern in one printing position and onto the print material comprising the steps of;

(a) determining the position of the print material in relation to a reference value in a first print-material registered position, a material feed position, and storing the resultant measurement value;

(b) transferring the print material to a second registered position, a printing position in a printing station for receipt of a second pattern belonging to the first printing station;

(c) moving the material printed with the second pattern back to the first position and determining the position of the printed second pattern in relation to said reference value in the first position, and storing the measurement value;

(d) displacing the stencil frame carrying the first pattern in the first printing station to an extent and in a direction such as to minimize a discrepancy established between the actual position of the pattern, obtained in the transfer and the pre-determined position of said pattern; and

(e) applying a second pattern with minimized discrepancy in the second position in the first printing station to each subsequent material registered in a similar manner in the first and the second position.

4,953,460

METHOD AND APPARATUS FOR SCREEN PRINTING

Thaddeus Wojcik, Hopewell, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

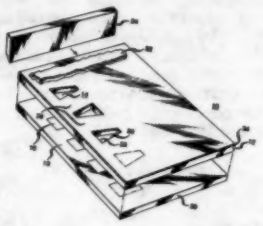
Filed Oct. 2, 1989, Ser. No. 415,805

Int. Cl.[5] B41M *1/12*

U.S. Cl. 101—129 **5 Claims**

1. A stencil comprising:

a substrate having at least a pair of trapezoidal openings, each of which has a pair of parallel ends and a pair of tapered longitudinal sides, the openings being arranged in alternating fashion such that the taper of the longitudinal sides of each opening is opposite to the taper of the sides of the openings adjacent thereto, thereby creating a web with tapered sides lying between the trapezoidal opening, the web having a greater resistance to buckling when a



squeegee crosses the web in a direction along a path at an angle to the trapezoidal opening sides.

4,953,461

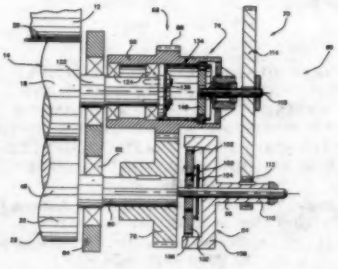
SYSTEM FOR CONTINUOUSLY ROTATING PLATE A BLANKET CYLINDERS AT RELATIVELY DIFFERENT SURFACE SPEEDS

John M. Gaffney, Kittery Point, Me.; Wilfred R. Gelinas, Jewett City, Conn.; Joel C. Hern, Dover, N.H., and Charles L. Krouse, Ashaway, R.I., assignors to Harris Graphics Corporation, Dover, N.H.

Filed May 20, 1988, Ser. No. 196,439

Int. Cl.[5] B41F *7/12, 13/14*

U.S. Cl. 101—142 **25 Claims**



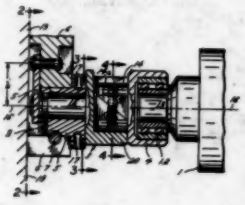
1. An apparatus operable to repetitively print the same image on sheet material, said apparatus comprising a rotatable plate cylinder having a peripheral surface for carrying the image to be printed on the sheet material, a rotatable blanket cylinder having a peripheral surface disposed in engagement with the peripheral surface of said plate cylinder to receive the image to be printed on the sheet material from said plate cylinder, and drive means connected with said cylinders for continuously rotating said plate and blanket cylinders during operation of said apparatus to print on sheet material, said drive means including a blanket cylinder gear connected in a coaxial relationship with said blanket cylinder, a plate cylinder gear connected in a coaxial relationship with said plate cylinder and disposed in meshing engagement with said blanket cylinder gear, and means for continuously rotating a first one of said cylinders relative to the one of said gears connected in a coaxial relationship with said first one of said cylinders throughout operation of said apparatus to print one sheet material.

4,953,462

BEARING FOR ROTARY PRESS CYLINDERS

Ulrich Krober, Offenbach am Main, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Fed. Rep. of Germany

Filed Feb. 16, 1989, Ser. No. 311,724
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805143
Int. Cl.[5] B41F *13/20, 13/28, 31/34*
U.S. Cl. 101—216 4 Claims



1. An adjustable bearing arrangement for mounting the spindle end of a rotary printing press cylinder, comprising: a press frame, an eccentric bushing rotatably mounted in an aperture in the press frame, clamping means for selectively locking said bushing in position in said frame aperture, a cylinder mounting bracket having a substantially axially extending locating pin rotatably received coaxially in said eccentric bushing, and an anti-friction bearing carried by said mounting bracket coaxially with said locating pin for journalling said cylinder spindle, rotation-inhibiting means for locking said locating pin in an operative position including a rotation-inhibiting lever, a substantially vertical groove formed in the end of said locating pin for receiving and guiding one end of said rotation-inhibiting lever, a knuckle joint disposed parallel to said locating pin, the other end of said lever being pivotally mounted on said press frame around said knuckle joint, said anti-friction bearing including an outer race disposed in an enclosed bearing support ring having a coaxially extending, generally round support pin formed with two substantially vertical and flat outer faces, said cylinder mounting bracket having a bearing support member for receiving said support pin and formed with an open radial slot on one side thereof aligned with said vertical groove in said locating pin and dimensioned to receive said flat outer faces of said support pin therebetween, and said support pin being rotatable within said support member so that said flat outer faces are out of registry with said slot and said support pin is retained in said support member.

4,953,463

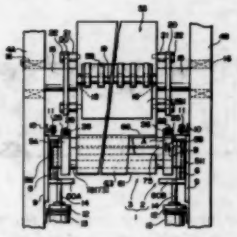
CLEANING APPARATUS FOR A CYLINDER

Akira Hara, Tokyo, Japan, assignor to B-J Trading Limited, Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,955
Claims priority, application Japan, Nov. 6, 1987, 62-280645
Int. Cl.[5] B41F *35/00*
U.S. Cl. 101—425 3 Claims

1. An apparatus for cleaning an outer peripheral surface of a rotating cylinder provided with a projection through said outer peripheral surface comprising:

a cleaner unit located in the vicinity of said cylinder and adapted to be brought into and out of contact with said outer peripheral surface of said cylinder, said cleaner unit including a cloth supply roll and a cloth take-up roll having a cleaning cloth wound at both ends on and tensioned between said cloth supply roll and said cloth take up roll, a driving device to intermittently rotate said cloth take up roll, a pressure pad for pressing said cleaning cloth onto the surface of said rotating cylinder to clean the same with said cleaning cloth being disposed between said pressure pad and the surface of said cylinder, and a pair of guide members for retractably moving said cleaning unit into and out of contact with said outer peripheral surface of said cylinder, at least one cam plate mounted on said cylinder at one end thereof, said cam plate having a cam



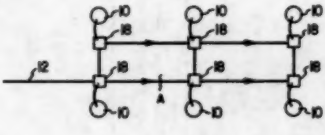
surface positioned so that its rotational phase corresponds to the rotational phase of the projection on said cylinder, and at least one cam follower attached to said cleaner unit adapted to cooperate with said plate cam and to retract said cleaner unit away from said cylinder when the projection on said cylinder is passing over said pressure pad.

4,953,464

MULTI-DIRECTIONAL SIGNAL TRANSMISSION IN A BLAST INITIATION SYSTEM

Peter F. Reiss, Sugarloaf, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Division of Ser. No. 72,544, Jul. 13, 1987, Pat. No. 4,821,645.
This application Nov. 23, 1988, Ser. No. 276,412
Int. Cl.[5] F42B *3/10*; C06C *5/00*
U.S. Cl. 102—312 11 Claims



1. A method for increasing the reliability of explosive detonation by providing more than one signal path comprising:

(a) connecting a downline from an explosive charge to be detonated to a first connector block such that the downline is in close proximity of a blasting cap contained within the connector block, said cap being connected to a first signal path;

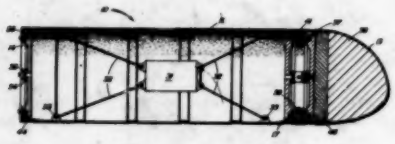
(b) adjoining one or more additional connector blocks containing blasting caps which are each connected to a separate signal path to the connector block which is connected to the downline, such that the blasting caps contained in the adjoined connected blocks are in close proximity such that detonation of any one of the caps by a signal from any one of the signal paths will sympathetically detonate the other caps and initiate a detonation signal in the downline.

4,953,465

FLEXIBLE MINE CASE

Ralph E. Hightower, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 31, 1963, Ser. No. 320,578
Int. Cl.[5] F42B *22/00*
U.S. Cl. 102—406 11 Claims



1. In a marine mine, a casing composed almost entirely of an outermost flexible, non-magnetic material and having at least one opening therein through which said casing may be loaded with an explosive charge and means for detonating said charge, means for sealedly closing said opening,

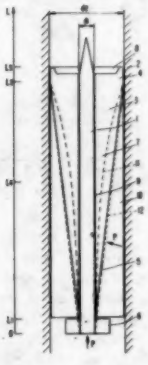
and reinforcing means secured externally to said casing for substantially maintaining the casing in a given general configuration when supplied with air under pressure, whereby said loaded casing retains said general configuration when thereafter inflated to a predetermined pressure but is distorted when planted underwater at depths where the sea pressure is greater than said predetermined pressure to lose said general configuration and thereby disguise its identity as a mine.

4,953,466

PROPULSION CAGE FOR A SUBCALIBER PROJECTILE

Johann von Gerlach, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 7, 1989, Ser. No. 334,367
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811597
Int. Cl.[5] F42B *14/08*
U.S. Cl. 102—521 11 Claims



1. A propulsion cage separated into segments and in shapemating relationship to a subcaliber projectile, the propulsion cage including a forward guide zone and a propulsion zone with a driving surface, the driving surface has a continuously increasing contour extending substantially over an entire length of the subcaliber projectile from a rear end of the subcaliber projectile to the forward guide zone and wherein an area in which the propulsion cage is adapted to abut a barrel is disposed at a maximally forward position of the propulsion cage.

4,953,467

TRACK SURFACING MACHINE WITH TRACK STABILIZATION

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 26, 1989, Ser. No. 343,072
Claims priority, application Austria, Sep. 15, 1988, 2270/88
Int. Cl.[5] E01B *27/00*
U.S. Cl. 104—7.1 6 Claims

1. A continuously advancing track surfacing machine for compacting a ballast bed supporting a track consistiag of two rails fastened to ties, the rails having facing gage sides and the ties having opposite ends, which comprises

(a) a machine frame,

(b) front and rear undercarriages supporting the machine frame on the track of mobility in an operating direction,

(c) a drive for propelling the machine frame along the track,

(d) a power actuated, vertically adjustable track stabilization assembly mounted on the machine frame between the undercarriages, the track stabilization assembly including

(1) rail-engaging roller tools,

(2) drive means for pressing the roller tools into engagement with the facing gage sides of the rails and

(3) means for vibrating the roller tools,

(e) a drive for vertically adjusting the track stabilization assembly,

(f) a track leveling reference system monitoring the track level,

(g) a vertically adjustable plow arrangement for smoothing the ballast bed mounted on the machine frame between the undercarriages and associated with the track stabilization assembly, the plow arrangement extending across the track at least from one of the tie ends to the opposite tie end, and

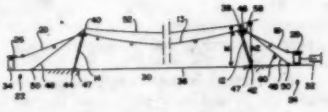
(h) a drive for vertically adjusting the plow arrangement into engagement with the ballast bed.

4,953,468

LARGE SPAN GONDOLA LIFT

Denis Creissels, Meylan, France, assignor to Pomagalski S.A., France

Continuation of Ser. No. 587,639, Mar. 8, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 821,527
Claims priority, application France, Mar. 21, 1983, 83 04707
Int. Cl.[5] E01B *25/00*
U.S. Cl. 104—123 5 Claims



1. An aerial cable transport installation for a gondola-lift or a cablecar having a large span, said installation comprising:

two towers located apart by a large spaced distance, each tower having a base anchored to the ground and a head forming a support point,

a carrier cable stretched between the two towers, said car-

rier cable being slidably supported on the tower heads and following a predetermined catenary trajectory,

at least one car carried by the carrier cable to travel on said trajectory,

a tower guying cable for each tower, each tower guying cable extending from an anchoring point adjacent the tower base to the tower head, and

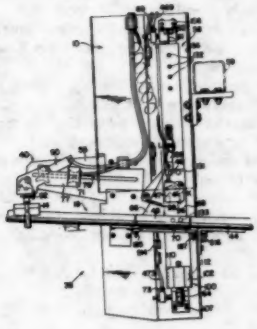
said towers being inclined and arranged to lean only towards one another to reduce the span of the carrier cable between the two towers and reduce a vertical height component of the towers required to span an identical horizontal distance between the bases of the towers, the distance between the carrier cable supnort points on the inclined towers being smaller than the distance between the bases anchored to the ground, each tower gradient being substantially perpendicular to said caternary trajectory of the carrier cable between the two towers at a point adjacent to that tower to minimize the tower height, each tower guying cable extending in a direction opposite a leaning direction of the corresponding tower.

4,953,469

SELECTIVELY POSITIONABLE VARIABLE HEIGHT WORKSTATION AND METHOD OF USE

Richard Kuchta, Tolland; Larry Billings, Manchester; Vladimir Evenzon, Vernon, and Donald Bristow, Ellington, all of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Sep. 15, 1989, Ser. No. 407,862
Int. Cl.[5] B61B *5/00*
U.S. Cl. 104—127 **29 Claims**



29. A trolley delivery apparatus, positionable in a gap formed between adjoining rails, said apparatus comprising:

a moveable rail section having opposite distal ends supported for movement between one position where said moveable rail section bridges a gap between opposed portions of adjoining rails and another position remote from said one position where said moveable rail section is positioned generally adjacent a workstation;

engagement means for arresting travel of a trolley at a position on said moveable rail section between said distal ends and for controllably accelerating said trolley off said rail section when said rail section is in said one position;

said engagement means being connected with and spaced from said moveable rail section such that said engagement means and said moveable rail section move in unison between said one and said another positions;

actuator means mounted to a support for moving said moveable rail section and said engagement means with one another between said one and said another positions;

control means for controllably energizing and deenergizing said engagement means and said actuator means so that a trolley traveling along said moveable rail section can be either diverted to said another position adjacent said workstation or allowed to pass from the moveable rail section onto one of said adjoining rails without being diverted from said one position;

said actuator means including a vertically oriented actuator capable of vertically moving said rail section and said engagement means between said one and said another position;

said actuator means having stop means including a lower adjustable stop for adjustably limiting the downward movement of said moveable rail section; and

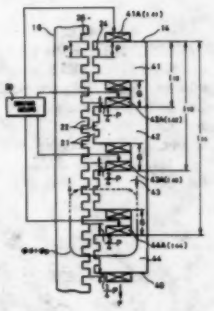
said engagement means comprises a pivotal cam biased in either rotational direction by a dual-action actuator connected with said control means such that said control means is capable of orienting said cam in either an open or closed orientation.

4,953,470

ATTRACTION TYPE MAGNETIC LEVITATION VEHICLE SYSTEM

Hitoshi Yamaguchi, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Nov. 25, 1988, Ser. No. 276,353
Claims priority, application Japan, Dec. 29, 1987, 62-335389
Int. Cl.[5] B60L *13/04*; H02K *41/00*
U.S. Cl. 104—282 **3 Claims**



1. In an attraction type magnetic levitation vehicle system of the type comprising a magnetic rail laid on the side of a track and a levitation vehicle having, a projection type supporting means and a projection type guide means each having a plurality of electromagnets excited by exciting coils, said plurality of electromagnets being arranged along the direction of said track such that a magnetic pole surface of each of said plurality of electromagnets is opposed to a surface of said magnetic rail, respectively, whereby said levitation vehicle is levitated above said magnetic rail without contact therewith by magnetic attraction forces between said magnetic rail and both said supporting means and guide means, the improvement comprising:

said plurality of electromaghets of said guide means being four in number; each of the distances between adjacent ones of the four electromagnets being respectively offset by a distance which is ¼ of the distance corresponding to said predetermined pitch from an integer multiple of said predetermined pitch; the distance between a first sequential one of said four electromagnets and a fourth sequential one of said electromagnets is equal to an integer multiple of said predetermined pitch, while the distances between the first and second electromagnets and between the third and fourth electromagnets are respectively offset by ¼ of the distance corresponding to said predetermined pitch from an integer multiple of said predetermined pitch;

the magnetic pole surfaces of (a) at least one of said supporting means and guide means and (b) the surface of said magnetic rail opposed to said magnetic pole surfaces each

being in the form of a rectangular waveform having a plurality of alternating groove-and-tooth pairs arranged at a predetermined pitch along the direction of said track;

at least one of the distances from one of said plurality of electromagnets which are in the form of a rectangular waveform to a remaining one of said plurality of electromagnets which are in the form of a rectangular waveform being offset from an integer multiple of said predetermined pitch along the direction of said track by a distance which is less than the length of one pitch; respective magnetic pole surface of both said supporting means and said guide means and the surfaces of said magnetic rail opposed to said magnetic pole surfaces having a shape in the form of said rectangular waveform; and

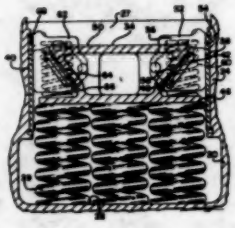
means for driving the exciting coils of each of said plurality of electomagnets which are in the form of a rectangular waveform by applying exciting currents, said exciting currents including a DC bias current for imparting magnetic force in a transverse direction to said track and pulse currents having a predetermined timing and sequence, thereby causing thrust to be produced on the levitation vehicle in the direction of said track.

4,953,471

FRICTION SHOE ASSEMBLY POR REPAIR OF WORN RAILWAY TRUCK

Robert D. Wronkiewicz, Park Ridge, and Charles Moehling, Arlington Heights, both of Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 4, 1989, Ser. No. 389,410
Int. Cl.[5] B61F *5/12*
U.S. Cl. 105—198.4 **12 Claims**



7. A friction shoe assembly for use in repair of a railway truck in which an abutting sloped surface of a truck bolster end has become worn during service, said friction shoe assembly comprising:

a friction shoe having a metal base section having a generally vertical, generally planar front face and at least one sloped surface extending downwardly at an acute angle in relation to an upper portion of said front face, and elastomeric pad means one of each received on each said sloped surface of said friction shoe for abutment to said corresponding sloped surface of said bolster end,

said sloped surface of said friction shoe adapted to receive and retain said elastomeric pad,

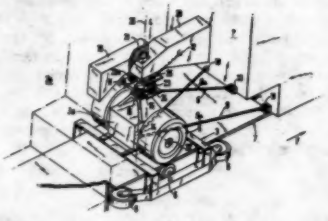
said elastomeric pad being trapezoid shaped in cross-section having a greater thickness at its upper end than its lower end and having an overall thickness such that, upon insertion of said elastomeric pad into said sloped surface of said friction shoe, a top surface of said elastomeric pad is adjacent to said abutting service worn sloped surface of said bolster end, thereby restoring said friction shoe to its original damping position.

4,953,472

RAIL VEHICLE, PARTICULARLY MONORAIL

Peter Tutzer, Kornwestheim, Fed. Rep. of Germany, assignor to Von Roll Transportsysteme AG, Thun, Switzerland

Continuation of Ser. No. 96,332, Sep. 14, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 228,037
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631461; Jan. 31, 1987, 3702900
Int. Cl.[5] B61G *5/02*
U.S. Cl. 105—4.3 **24 Claims**



1. A rail vehicle, particularly a monorail, comprising:

a plurality of cars defining adjacently arranged cars;

each of said cars having a median longitudinal plane;

interconnecting a means including a respective coupling device for interconnecting two adjacently arranged cars;

a respective bogie disposed between each of said two adjacently arranged cars and having a longitudinally extending vertically oriented median plane;

each said bogie being provided with axle suspension means for carrying and supporting guide wheels capable of running on a track;

said axle suspension means including a wheel axle provided for said supporting wheels;

a guide arrangement supported on the bogie;

said guide arrangement including said interconnecting means and being provided with at least bearing means in said plane of said bogie;

spaced pivot means on an end of one only of each of said adjacently arranged cars and having pivot axes extending at a right angle to the said longitudinal plane of said one car;

guide means extending from said bearing means only to said spaced pivot means;

each said coupling device being provided with a connecting joint; and

said connecting joint together with said guide arrangement forming a steering axis which, in said median longitudinal planes of each two adjacently arranged ones of said cars, passes both through said connecting joint and through said bearing means of said guide arrangement supported on said bogie,

said guide arrangement maintaining said longitudinal plane of said one car in an orientation to substantially contain said steering axis.

4,953,473

COMBINATION SERVING TRAY, BED TRAY AND BATHTUB TRAY

Leonard P. Tomaka, #4817 175 E. Delaware Pl., and Larry M. Dreyfus, #4819 175 E. Delaware Pl., both of Chicago, Ill. 60611

Filed Jan. 18, 1990, Ser. No. 466,770
Int. Cl.[5] A47B *3/00*
U.S. Cl. 108—132 **17 Claims**

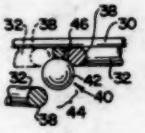
16. In a combination serving tray, bed tray and bathtub tray, the subcombination which comprises:

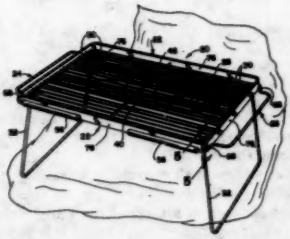
(a) an elongated tray frame providing a support surface for objects to be placed on the tray;

(b) a "U"-shaped leg hinged at each end of the tray to swing

from a closed position located underneath the tray frame, in which position the leg is substantially parallel to the bottom surface of the tray, downward into a vertical position and then beyond into an over-center, open position, in which position the leg is generally upright, said "U"-shaped leg having a bight portion that is normally stiff but is resiliently bendable under pressure;

(c) stop means for each of said "U"-shaped legs, said stop means being configured to limit the leg from moving beyond said over-center, open, generally upright position, in which position the two "U"-shaped legs hold the tray at a predetermined height above the surface on which the legs are supported; and





(d) latch means located on the underside of the tray, said latch means including a camming surface associated with each of said "U"-shaped legs, each of said camming surfaces facing an end of the tray in a position to engage the bight portion of its associated "U"-shaped leg when the leg is swung up from its open position to its closed position, said camming surface being configured to bend said resiliently bendable bight portion of the leg as the bight portion (i) is pushed toward the bottom of the tray by the user of the tray, (ii) slides across said camming surface, and (iii) after riding over the camming surface, snaps back to its normal shape to hold the leg in its closed position beneath the tray.

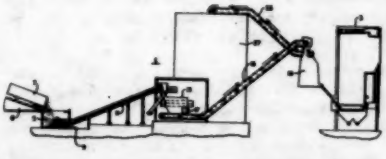
4,953,474

FUEL METERING BIN LEVEL CONTROL

Albert Armitage, Milton, Wash., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1990, Ser. No. 470,472
Int. Cl.[5] F23K *3/00*
U.S. Cl. 110—101 CD **8 Claims**

1. A fuel metering bin level control for a fuel bin having a feed conveyor which supplies fuel to the metering bin, a an



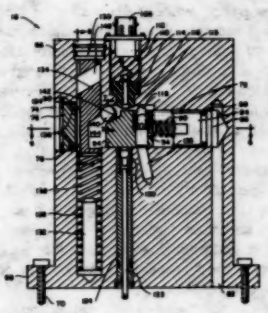
auger conveying system for moving fuel across the top of the bin, and a storage conveyor for transferring excess fuel from the metering bin to a storage silo, said fuel metering bin level control comprising an opening at the bottom of the auger conveyor, a chute extending downwardly from said opening, means for opening and closing off the bottom of said chute, and means for responding to the level of fuel in said metering bin to operate said chute opening and closing means to close the chute when the level of fuel in the fuel metering bin reaches a level above a predetermined level and to open said chute when a level below the predetermined level is reached, whereby bridging of the fuel in the fuel metering bin is eliminated.

4,953,475

SAFETY-ARMING SYSTEM FOR LAUNCHED PROJECTILES

Arnold S. Munach, Rockville, and John Q. Nguyen, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1989, Ser. No. 447,329
Int. Cl.[5] F42B *15/32*
U.S. Cl. 102—229 **33 Claims**



16. In a safety system carried by a projectile having a detonator and control means responsive to operating energy applied thereto enabling the detonator, means responsive to launching of the projectile for storing the operating energy therein and means operatively connected to the control means for delaying the application of the operating energy thereto from the storing means in response to acceleration of the projectile during said launching thereof.

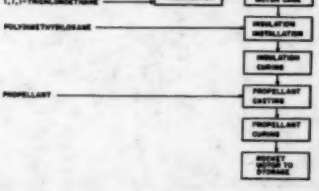
4,953,476

SILOXANE-BASED ELASTOMERIC INTERCEPTOR MOTOR INSULATION

David C. Sayles, 9616 Dortmond Dr. SE., Huntsville, Ala. 35803

Filed Jan. 16, 1990, Ser. No. 465,818
Int. Cl.[5] C06D *5/06*
U.S. Cl. 102—289 **3 Claims**

1. A method of installing a polysiloxane insulation in an interceptor rocket motor, said method comprising of completing following the steps:



(i) providing a composite rocket motor case designed for use in an interceptor rocket motor;

(ii) applying an adhesive siloxane composition that is compatible with said composite rocket motor case to the inner surfaces of said composite rocket motor case;

(iii) providing a polysiloxane elastomer having an empirical formula represented by the following structural formula:

wherein R is an alkyl group and n is a whole integer and said polysiloxane elastomer prior to curing has the physical properties of a viscous fluid;

(iv) introducing said polysiloxane elastomer and any added reinforcing fibers, including fragile fibers, into a mixer-extruder;

(v) extruding and transporting said polysiloxane elastomer and any added reinforcing fibers to an application head where a payoff wheel rolls a strip of said polysiloxane elastomer and any added reinforcing fibers onto the inner surface of said composite rocket motor case as said composite rocker motor case is being rotated and while said application head is moved axially by carriage means;

(vi) controlling the axial speed of said application head so that each turn of said strip overlaps the previous turn similar to the way that a roof is shingled;

(vii) means for controlling the uniformity of application of said polysiloxane elastomer and any added reinforcing fibers to complete the installing of said polysiloxane insulation in an uncured state;

(viii) curing said polysiloxane insulation;

(ix) casting a solid propellant composition onto said cured polysiloxane insulation; and;

(x) curing said solid propellant composition to complete said method of installing a polysiloxane insulation in an interceptor rocket motor.

4,953,477

METHOD AND APPARATUS FOR REGULATING THE FURNACE OUTPUT OF INCINERATION PLANTS

Johannes J. E. Martin, Munich, Fed. Rep. of Germany, assignor to Martin GmbH fur Umwelt- und Engerie-Technik, Munich, Fed. Rep. of Germany

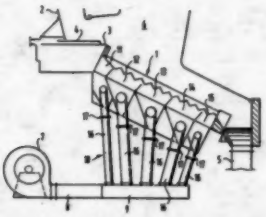
Filed Jul. 21, 1989, Ser. No. 384,214

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825931

Int. Cl.[5] F23N *5/02*

U.S. Cl. 110—190 **7 Claims**

1. A method for regulating the furnace output of incineration plants having a combustion grate, in which the primary air supply is regulated variously by zones along the length of the grate, the steps of the method comprising: regulating the primary air supply variously by zones in the transverse direction



of the combustion grate, monitoring the individual combustion zones and supplying the primary air quantities to the individual combustion zones corresponding to the burning behavior of the combustible material prevailing in the respective zones.

4,953,478

ODOR CONTROL FOR A SLUDGE TREATMENT PROCESS

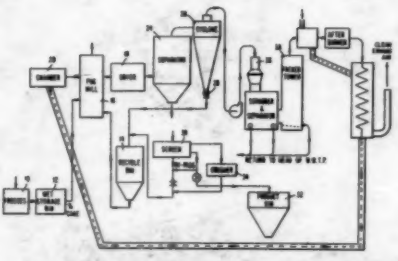
John D. Glorioso, Clearwater, Fla., assignor to Enviro-Gro Technologies, Baltimore, Md.

Division of Ser. No. 220,207, Jul. 18, 1988, Pat. No. 4,860,671, which is a continuation-in-part of Ser. No. 924,630, Oct. 29, 1986, Pat. No. 4,761,893. This application May 9, 1989, Ser. No. 350,059

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] F23J *15/00*

U.S. Cl. 110—215 **17 Claims**



1. A process for drying mechanically dewatered sewage sludge to produce pellets of a predetermined small and uniform size comprising the steps of:

mixing said sludge with recycled, previously dried sludge particles and pellets;

drying said mixture in a thermal drier to form pellets and particles thereof;

conveying the dried pellets and particles and dryer off-gas to a low velocity gas/solids separator and separating and collecting the pellets and a substantial portion of the particles;

clarifying the collected pellets and particles and separating and collecting the pellets of a predetermined size, from the undersized pellets and particles and the oversized pellets and collecting the undersized pellets and particles and the oversized pellets for recycling;

mechanically crushing the recycle materials and collecting the crushed pellets and particles;

recycling the collected pellets and particles by mixing said recycled materials with said incoming sludge to the dryer;

collecting the off-gas from the gas/solids separator and removing substantially all of the fines therefrom;

condensing at least a portion of the water vapor contained therein;

and burning said gases to remove impurities therein before releasing said gases into the atmosphere.

4,953,479

METHACOAL INTEGRATED COMBINED CYCLE POWER PLANTS

Leonard J. Keller, and Austin N. Stanton, both of 1501 N. Cedar St., Bonham, Tex. 75418

Continuation-in-part of Ser. No. 204,240, Jun. 9, 1989, abandoned. This application Dec. 21, 1989, Ser. No. 454,141

Int. Cl.[5] F23B *7/00*

U.S. Cl. 110—233 **17 Claims**

1. Improved means of providing low-capital-cost, fuel-integrated, fully-fired, combined cycle power plants, called Methacoal Integrated Combined Cycle (MICC) Power Plants, for utilizing anhydrous or low moisture content coal-methanol slurry fuels (Methacoal fuels), and capable of achieving very high energy conversion efficiencies and low-cost electric power generation, and also capable of substantially reducing exhaust gas emissions of nitrogen oxides, sulphur oxides and ultra-fine (one-tenth micron particle size range) particulates, compared to conventional coal-fired or conventional lignite-

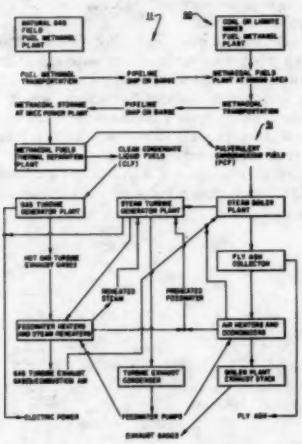
fired power plants which are not equipped with the most advanced chemical scrubbers, comprising:

a thermal separation plant for said Methacoal fuels for producing clean condensate liquid fuels (CLF), and highly reactive pulverulent carbonaceous fuels (PCF);

a gas turbine generator plant for burning said CLF, in liquid or vapor form, to produce electric power;

a steam boiler plant, or steam generator plant, for burning said PCF to produce steam for said electric power generation;

a relatively small firebox for said steam boiler plant, designed to accommodate the rapid-burning said PCF, provide near-optimum retention time for the products of combustion at the high firebox temperatures, and provide substantially complete combustion, limit the retention time sufficiently to minimize the formation of said nitrogen oxides, and minimize ash fusion problems and slagging problems in said firebox and in other parts of said steam boiler plant;



a steam turbine generator plant for using said steam to produce additional said electric power;

said gas turbine generator plant and said steam turbine generator plant sized in capacity, with respect to one another, to provide the total capacity desired, and to also allow the use of essentially all of said CLF and essentially all of said PCF, during normal operating conditions and ranges of load requirements, to allow adequate management of inventories of said CLF and said PCF as fuels for said MICC power plant;

means for utilizing essentially all of the gas turbine exhaust gases as the principal source of firebox combustion air for burning of said PCF in said firebox, during most of said normal operating conditions and said normal ranges of load requirements, to effect the recovery and reuse of most of the heat energy from said gas turbine exhaust gases for use in the generation of said steam.

4,953,480

ROTARY WATERWALL COMBUSTOR WITH IMPROVED TIRE ATTACHMENT

William G. Collins, Jr., Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 31, 1989, Ser. No. 387,672

Int. Cl.[5] A47J *36/00*

U.S. Cl. 110—246 **12 Claims**

1. A plurality of improved attachments connecting a rotary waterwall combustor to a tire, each of said improved attachments comprising a support block attached to said rotary waterwall combustor, a linkage, a pin arrangement pivotally connecting said support block to said tire and elongated openings cooperating with said pin arrangement so that only tensile forces are transmitted through said linkage and pin arrangement to support said rotary waterwall combustor within said tire, maintain the position of the central axis of the rotary waterwall combustion and provide for differential thermal expansion of the rotary waterwall combustor, the linkage and the tire.

4,953,481

METHOD FOR CONTROL OF SLAG BUILD-UP IN SOLID WASTE INCINERATORS

Dennis A. Clayton, Stanchfield, Minn., assignor to Utility Chemicals, Inc., Cambridge, Minn.

Filed Sep. 1, 1989, Ser. No. 401,761

Int. Cl.[5] F23B *7/00*

U.S. Cl. 110—342 **11 Claims**

1. The method of controlling slag build-up in waste burning incinerators, which comprises adding to the burning waste in the combustion zone of the combustion chamber of the primary incinerator per ton of waste fuel about ½ to 5 pounds of a melting point enhancing particulate material comprised of a mixture of magnesium oxide and calcium carbonate in the ratio of 2:1 to 1:2, and having a particle size between about 50 and 500 mesh, sufficient to raise the melting point of slag-forming ash above the highest operating temperature of the incinerator.

4,953,482

MULCHING AND SEEDING APPARATUS AND METHOD WITH FILM SEVERING AND COVERING

Jean Y. Emily, Landerneau, France, assignor to Atochem, Paris, France

PCT No. PCT/FR85/00195, § 371 Date Jul. 17, 1986, § 102(e) Date Jul. 17, 1986, PCT Pub. No. WO86/00780, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 17, 1985, Ser. No. 862,360

Claims priority, application France, Jul. 18, 1984, 84 11617

Int. Cl.[5] A01C *5/06*

U.S. Cl. 111—144 **8 Claims**

1. In a mulching and seeding apparatus for forming a soil seed bed row, depositing film on the ground over said soil seed bed row from a rotatable film reel on said apparatus, forming orifices in said film and planting seeds in said soil seed bed through said orifices in said film, the improvement comprising:

a. severing means attached to said apparatus for severing said film from said reel at the end of a row to leave a ground film end and a reel film end, and concurrently depositing soil on said ground film end to hold said ground film end in place on said seed bed; and

b. means on said apparatus for preventing said reel film end from being unreeled during movement of said apparatus to the beginning of another seed bed row which is to be formed, covered with film and seeded, and wherein said severing means comprises:

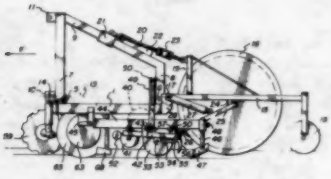
c. a knife blade rotatably mounted on said apparatus in a first

position above and extending transversely across said film when deposited on said soil seed bed; and

d. driven means for rotating said knife blade through a stroke of the blade to a second position in a direction toward said soil to sever said film and create an end thereof while during said same stroke burying said end with said knife blade.

8. In a method of forming a soil seed bed row with mulching apparatus, covering said row with a plastic film from a reel on said apparatus and forming openings in said film by said apparatus through which seeds are planted in said seed bed, the improvement comprising the steps of:

a. operating a knife on said apparatus through a stroke of said knife by driven means and with said knife severing said film from said reel during said stroke at the end of a seed



bed row to leave a seed bed end and a reel end of said film;

b. during some stroke of said knife depositing soil on said seed bed end of said film with said knife to hold said film in place on said seed bed,

c. preventing said reel end of said film from unwinding from said reel by setting a brake on said apparatus during movement of said apparatus from the end of a completed seed bed row to the beginning of another seed bed,

d. depositing soil on the reel end of said film with a further driven operation of said knife at the beginning of said another seed bed row to hold said film in place; and

e. allowing rotation of said film reel by releasing said brake during movement of said apparatus while forming said another seed bed row thereby depositing a film cover over said another seed bed row.

4,953,483

AUTOMATIC QUILTING MACHINE AND METHOD FOR SPECIALIZED QUILTING OF PATTERNS WITH SEPARATE COMPUTERS TO CONTROL THE STITCHING AND TABLE MOVEMENT FUNCTIONS

David Brower, Tarzana, and Thomas K. Jernigan, North Hollywood, both of Calif., assignors to TD Quilting Machinery, Burbank, Calif.

Filed Aug. 4, 1989, Ser. No. 389,892
Int. Cl.[5] D05B *21/00*
U.S. Cl. 112—119 **11 Claims**

1. A frame quilting machine comprising:

a. a frame member for retaining a fabric;

b. said frame member mounted on a structure which can be moved in the X-direction, the Y-direction, or any X-Y combination direction;

c. a first cross beam extending horizontally over said frame member;

d. a second cross beam aligned parallel to said first cross beam and extending horizontally beneath said frame member;

e. a first motor to generate movement of said frame member in the X-direction;

f. an X axis controller connected to said first motor;

g. a second motor to generate movement of said frame member in the Y-direction;

h. a Y axis controller connected said second motor;

i. a first process controller having an Input/Output board having an X-output connected to said X-axis controller and a Y-output connected to said Y-axis controller to thereby process commands to enable the frame member and the fabric retained thereon to be moved horizontally in the X-direction, the Y-direction, and any combination X-Y direction between said first cross beam and said second cross beam;

j. a monitor;

k. a sewing machine head attached to said first cross beam and having a source of thread;

l. a sewing needle extending from said sewing machine head and positioned to sew threads into said fabric while the frame member and structure move underneath said first cross beam and above said second cross beam;

m. a sewing machine plate attached to said second cross beam and aligned with said sewing machine head and sewing needle;

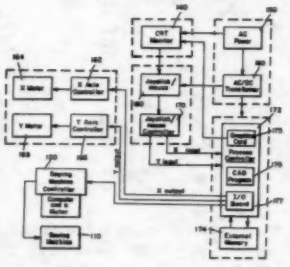
n. said monitor and said process controller connected to a source of power;

o. said first process controller further comprising a graphics card to enable commands from the process controller to be viewed on said monitor;

p. a graphic movement apparatus which enables a graphic cursor to draw patterns on said monitor;

q. said first process controller further comprising a memory to store machine readable patterns;

r. said first process controller programmed with a computer aided design program which comprises menus



of selected shapes which can be viewed on said monitor and used to sketch all or a portion of a desired pattern to be sewn into said fabric; and

s. a second process controller connected to said sewing machine head for processing sewing function commands to the sewing machine head, the second process controller also connected to said Input/Output board of said first process controller;

t. whereby an operator may draw a pattern on said monitor through use of the graphic movement apparatus combined with the computer aided design program, convert the pattern into machine readable language through the computer aided design program, store the pattern in machine readable language in the memory of the computer and cause the pattern to be duplicated on the fabric through commands from the process controller to the X-axis controller and Y-axis controller which causes said frame member to move relative to said first and second cross-beam to thereby bring locations on the fabric into alignment with said sewing needle as the pattern is sewn into said fabric, and new programs for the frame movement can be programmed into said first process controller independently of reprogramming the second process controlled and new sewing machine commands can be programmed into said second process controller independently of said first process controller.

4,953,484

OVEREDGE SEWING MACHINE FOR CUTTING THE EDGE OF A FABRIC WHILE SEWING AN OVEREDGE STITCH

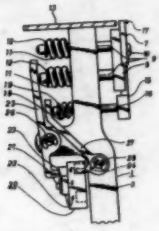
Hiroaki Fukao, Kasugai; Teruhiko Ohkita, Nagoya; Nobusuke Nagasaka, Aichi, and Tateo Ueno, Mizunami, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 23, 1989, Ser. No. 355,677

Claims priority, application Japan, May 26, 1988, 63-129370; May 28, 1988, 63-131070

Int. Cl.[5] D05B *37/06*

U.S. Cl. 112—162 **10 Claims**



1. An overedge sewing machine comprising:

a needle location for holding a needle, said needle location having a feed side over which fabric is fed prior to reaching the needle location, fabric being fed toward the needle location in a fabric-feed direction;

upper and lower knives disposed on the feed side of the needle location for cutting an edge of a fabric being fed toward the needle location;

a lower knife holder movable in a direction perpendicular to the fabric-feed direction for supporting the lower knife;

a stitch-support member near the needle location, extending away from the feed side and movable in the direction perpendicular to the fabric-feed direction;

an adjustment member for adjusting the stitch width;

displacement means responsive to said adjustment member for moving said lower knife holder and said stitch-support member by first and second displacement amounts respectively on movement of said adjustment member by a given amount.

4,953,485

AUTOMATIC QUILTING MACHINE FOR SPECIALIZED QUILTING OF PATTERNS WHICH CAN BE CREATED BY UTILIZING COMPUTER GRAPHICS IN CONJUNCTION WITH A REPROGRAMMABLE COMPUTER

David Brower, Tarzana, and Thomas K. Jernigan, Canoga Park, both of Calif., assignors to TD Quilting Machinery, Burbank, Calif.

Filed Apr. 10, 1989, Ser. No. 336,007

Int. Cl.[5] D05B *21/00*

U.S. Cl. 112—262.3 **51 Claims**

50. The method of repetitively sewing a pattern into a fabric having a large surface comprising:

a. positioning a sewing machine head having a source of thread and a sewing needle relative to said fabric;

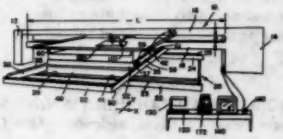
b. retaining said fabric on a movable structure which can be made to move in a horizontal direction relative to the sewing needle and which can cause a portion of the surface of the fabric to be reached by the sewing needle so that thread can be sewn into the fabric;

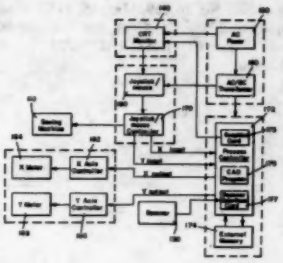
c. controlling the movement of the movable structure relative to the sewing needle by a process controller;

d. creating a pattern on a monitor through use of a cursor and cursor movement apparatus combined with a computer aided design program which converts the pattern into machine readable language;

e. storing the machine readable pattern in the memory of said process controller; and

f. mapping the completed pattern on a computer grid to select where the pattern is to be duplicated on said fabric;





g. whereby the process controller can cause the movement of the movable structure relative to the sewing needle to thereby duplicate the pattern stored in its memory at any multiplicity of desired locations.

4,953,486

ELECTRONIC ZIGZAG SEWING MACHINE

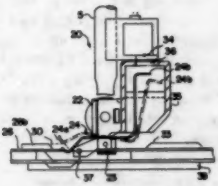
Yasuro Sano, 1601-2, Narahara-cho; Akira Orii, 432, Terada-cho, and Eiji Murakami, 682-1, Izumi-cho, all of Hachioji, Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,879

Claims priority, application Japan, Oct. 23, 1987, 62-266205

Int. Cl.[5] D05B *3/06*

U.S. Cl. 112—447 **3 Claims**



1. An improved electronic zigzag sewing machine comprising memory means for storing stitch control data for each stitch of a plurality of stitch patterns including one or more of buttonhole stitch pattern, said buttonhole stitch pattern being divided into plural parts to be sequentially produced in response to stitch control data assigned to each of said parts; selecting means for selecting a desired one of said stitch patterns; control means for reading out said stitch control data for a selected one of said stitch patterns, thereby controlling a needle amplitude and a fabric feeding amount; and signal generating means for generating a signal commanding a timing at which stitching operation of said buttonhole stitch pattern is to proceed from one part to the next part, said signal being supplied to said control means for reading out the stitch control data for the said next part of said buttonhole stitch pattern; the improvement wherein said signal generating means comprises an automatic generating means for generating a first timing signal when sensor means mounted on a first presser foot automatically detects a final stitch of said one part of said

buttonhole stitch pattern, and a manual generating means manually operated by an operator for generating a second timing signal when the operator visually detects said final stitch of said one part of said buttonhole stitch pattern, said control means being operated to read out the stitch control data for the said next part of said buttonhole stitch pattern in response to any one of said first and second timing signals.

4,953,487

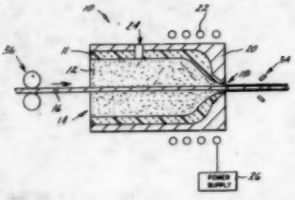
ELECTROMAGNETIC SOLDER TINNING SYSTEM

Brian G. Lewis, Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 26,429, Mar. 16, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 289,403

Int. Cl.[5] B05C *3/02, 3/12*

U.S. Cl. 118—620 **4 Claims**



1. An apparatus for applying a coating having a desired thickness to at least one surface of a substrate, said apparatus comprising:

means for containing a supply of coating material, said containing means having an inlet through which said substrate enters and an outlet through which said coated substrate exits; means for applying pressure to said coating material to restrict the flow of said material through said outlet and to control the thickness of said coating on said substrate;

said pressure applying means including means for generating an electromagnetic field, said electromagnetic field causing the generation of heat within said coating material to maintain it in a molten condition and creating magnetic forces for damming the flow of said coating material through said outlet and controlling said coating thickness;

said electromagnetic field generating means including an inductor surrounding at least a portion of said containing means and means for supplying a time varying current at a desired frequency to said inductor; and

a flux concentrator intermediate said inductor and said containing means, said flux concentration being positioned close to said outlet.

4,953,488

BOAT CARROUSEL

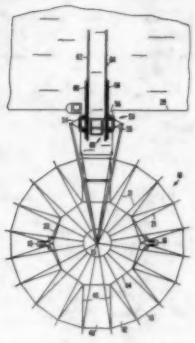
Heinrich Heidtmann, RR 6 Box 11500, Rio Piedras, P.R. 00928

Filed Oct. 25, 1988, Ser. No. 223,939

Int. Cl.[5] B63B *35/44*

U.S. Cl. 114—44 **5 Claims**

1. A storage facility for individually movable units comprising a cylindrical storage tower formed as a rotatable structure having a spaced series of superposed annular stories each sub-divided into circumferentially spaced, substantially radial storage regions of sizes to receive said units, each region having an outer end opening to the exterior of said storage tower, and elevator means including a lift tower fixed in close spaced adjacency to the exterior of said storage tower, and a lift car movable vertically on said lift tower between a loading/unloading station at the bottom of said lift tower and any level corresponding to a selected story of said storage tower, said lift car including a pair of laterally spaced movable fingers substantially radially arranged with respect to the vertical axis of said cylindrical storage tower, means carried by said lift car for moving said fingers between a retracted position wherein said fingers are clear of said storage tower and an extended position wherein said fingers project from said lift car into a selected



storage region to deposit or pickup a unit therein, and power means for rotating said storage tower to a position wherein the open end of said selected storage region is in radial alignment with said lift tower.

4,953,489

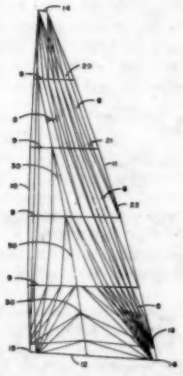
TRIRADIAL SAIL PANEL CONFIGURATION WITHOUT BIAS EDGES

Clarke C. Bassett, 84 Waterside La., Cottage #1, Clinton, Conn. 06413

Filed Jul. 13, 1989, Ser. No. 379,428

Int. Cl.[5] B63H *9/04*

U.S. Cl. 114—103 **11 Claims**



1. A sail comprising a number of pluralities of radial panels, each panel comprising a pair of parallel edges parallel to a longitudinal axis of symmetry of the panel:

each of the pluralities oriented to substantially radiate from a respective attachment means for transferring wind loads to a sailing vessel:

said panels of each plurality oriented and angled to each other

to converge near said attachment means,

to overlap more of each other near said attachment means,

to diverge distant from said attachment means, and

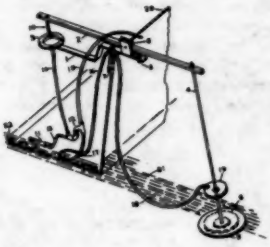
to overlap less of each other distant from said attachment means.

4,953,490

WAVE OPERATED BOAT PUMP

Winston J. Smith, 6550 Edgewater Dr., Erie, Mich. 48133, assignor to Winston J. Smith, Erie, Mich.

Filed Dec. 19, 1989, Ser. No. 454,439
Int. Cl.[5] B63B *13/00*
U.S. Cl. 114—183.00 A 5 Claims



1. A wave operated boat pump comprising:
a diaphragm pump having an actuating attachment bolt;
a rocking arm coupled to said diaphragm pump through said actuating attachment bolt;
a pivoting means that allows said rocking arm to rock or pivot on a mounting bracket;
a rocking arm stop means positioned on said mounting bracket as to limit said rocking arm movement;
a submerged resistance plate linked to said rocking arm by a connecting arm;
a neutral buoyancy component attached to said submerged resistance plate;
said mounting bracket supporting said diaphragm pump, and including detachable installation means to a boat hull;
a bilge water discharge check valve assembly having an inlet side and an outlet side, said bilge water discharge check valve assembly connected to said diaphragm pump by an upper pumping tube, and said bilge water discharge check valve assembly also connected to a bilge water intake check valve assembly by a lower pumping tube;
a standpipe tube connected to said outlet side of said bilge water discharge check valve assembly;
a bilge water siphon discharge tube connected to said outlet side of said bilge water check valve assembly; and
a bilge water siphon discharge tube float having means for buoyantly supporting the discharge end of said bilge water siphon discharge tube.

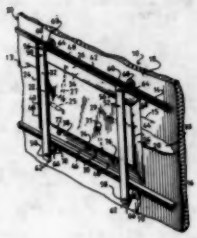
4,953,491

TEMPORARY, REUSABLE, MOVABLE HULL PATCH FOR A DAMAGED OIL TANKER

Hanna Zaitoun, 358 89th St., Brooklyn, N.Y. 11209

Filed Dec. 4, 1989, Ser. No. 445,407
Int. Cl.[5] B63B *43/16*
U.S. Cl. 114—229 6 Claims

1. A temporary, reusable, movable hull patch for a damaged oil tanker hull having sides, said hull patch, comprising:
(a) an upper track being ridigly affixed to each side of the hull;
(b) a lower track being rigidly affixed to each side of the hull and spaced a distance below said upper track;
(c) a body portion;
(d) four flaps framing said body portion and having four free edges, respectively, and containing a resilient material so as to provide a good seal between said hull and said four flaps, said four flaps having a sealed position and an unsealed position;
(e) four pivots for pivotally connecting said four flaps to said body porton, respectively;
(f) four hydraulic cylinders for moving said four flaps from



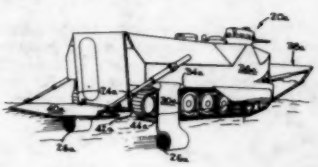
said sealed position to said unsealed position and vice versa; and
(g) two trucks attached to and riding on said lower track and said upper track.

4,953,492

WATER SUPPORTING AND PROPULSION SYSTEMS

Bryan Duffty, Gilroy, Calif., assigner to FMC Corporation, Chicago, Ill.

Filed Jun. 21, 1989, Ser. No. 369,178
Int. Cl.[5] B60F *3/00*
U.S. Cl. 114—282 14 Claims



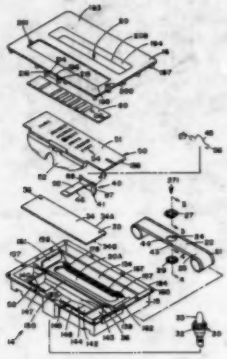
1. A power driven watercraft having a longitudinal axis, comprising:
means defining transversely aligned right and left water propulsion systems attached only to the rear portions of side walls of the watercraft and each supporting a water propulsion module, and each propulsion system including a single mounting leg and a hydrofoil extending substantially perpendicular to the associated mounting leg and defining an apex therebetween;
first power means connected between said watercraft and associated ones of said mounting legs for moving said right and left propulsion systems transversely of said axis between an operative position within the water and a stowed position above the water; and
second power means carried by said watercraft and disposed at associated ones of said apexes for driving said right and left water propulsion systems for propelling the watercraft up to a speed of at least 20 miles per hour when supported by water.

4,953,493

RATTLE RESISTANT GEARSHIFT POSITION INDICATOR

James W. Richmond, Carmel, Ind., assignor to Emhart Industries, Inc., Towson, Md.

Filed Dec. 22, 1988, Ser. No. 288,224
Int. Cl.[5] G09F *09/40*
U.S. Cl. 116—28.1 **5 Claims**



1. A gearshift level operating position indicating mechanism comprising:

a housing having a window in it and having an aperture means for passing said shift lever through the housing;

indicia means for labeling the operating positions of said gearshift lever, said indicia means being viewable in said window and including a plurality of indicia;

an indicating member;

indicating member support means for connecting said member to said gearshift lever and for movably supporting said indicating member within said housing over a range of movement along a first axis that permits it to be visually aligned in said window with said plurality of indicia, said indicating member including a surface at an angle to said first axis; and

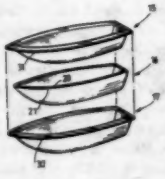
spring means preventing movement of said member along second and third axes substantially orthogonal to said first axis and to each other to prevent said member from rattling, said spring means comprising a single piece of wire engageable with said housing and said surface.

4,953,494

METHOD FOR MOLDING LARGE PLASTIC UNITARY CORE BOATS

Zach McClendon, Jr., Rte. 2, Box 31B, Monticello, Ark. 71655

Continuation of Ser. No. 1,367, Jan. 8, 1987, abandoned. This application May 19, 1988, Ser. No. 195,910
Int. Cl.[5] B63B *35/00*
U.S. Cl. 114—357 **16 Claims**



1. A method for making a large boat comprising the steps of:

a. molding a unitary plastic foam core extending from bow to stern having an inner surface and an outer surface, said core having a thickness of at least one foot in all dimensions;

b. heat curing the core;

c. individually molding an outer skin configured to match the outer surface of the core, and having a mating edge, said outer skin being substantially thinner in cross-sectional thickness than said core;

d. individually molding an inner skin configured to match the inner surface of the core, and having a mating edge, said inner skin being substantially thinner in cross-sectional thickness than said core;

e. bonding the outer skin and the inner skin to the outer and inner surfaces, respectively, of the core; and

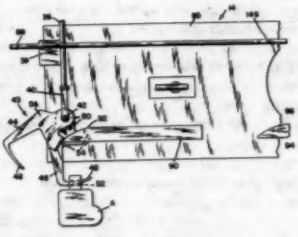
f. bonding together the mating edges of the outer skin and the inner skin to sealingly enclose the core.

4,953,495

ARTICLE COATING SYSTEM

Richard Salisbury, Laguna Niguel, Calif., assignor to Biodgett & Blodgett, Worcester, Mass.

Filed Feb. 1, 1989, Ser. No. 305,453
Int. Cl.[5] B05C *1/02, 19/04*
U.S. Cl. 118—70 **18 Claims**



1. A apparatus for applying a coating of plastic to a metallic article having a configuration which enables the article to be suspended on the free end of a projecting element, said apparatus comprising:

(a) an overhead conveyer which moves along a predetermined path,

(b) a metallic connector which is suspended from said conveyor for movement along said path,

(c) a metallic carrier assembly which comprises a pair of carriers for jointly carrying the article, each of said carriers having a projecting lower free end portion for supporting the article in suspension, each of said carriers being mounted on said connector for movement relative to the connector from a lower article supporting position to an upper position in which the carrier is completely free of the article, while the article is carried solely by the other of said carriers,

(d) a spray station along the path of said conveyed article for spraying a loose coating of ionized plastic particles on said article,

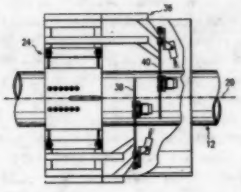
(e) cleaning means along the path of said conveyed article downstream of said spray station for moving each carrier in succession to the upper position and for removing said plastic particles from at least the lower free end of each of said carriers when it is in the upper position, and

(f) a curing oven along the path of said conveyed article downstream of said cleaning station for curing said plastic particles to form a permanent coating of plastic on the article.

4,953,496
HIGH PRESSURE WATER JET CLEANER AND COATING APPLICATOR

Sidney A. Taylor, Houston, and Stanely J. Rogala, Katy, both of Tex., assignors to CRC-Evans Pipeline International, Inc., Houston, Tex.

Filed Jul. 17, 1989, Ser. No. 381,103
Int. Cl.[5] B05C *1/04*
U.S. Cl. 118—72 9 Claims

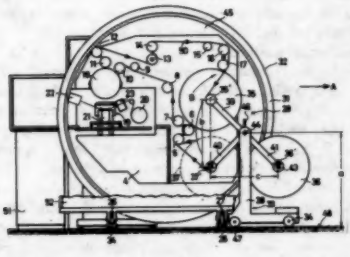


1. An apparatus for treating a pipeline, comprising:
a centering assembly mounted on the pipeline for movement along the pipeline, said centering assembly having a frame member and at least one arm pivotally mounted to the frame member for movement between a first operating position and a second installation position;
a nozzle carriage assembly mounted on the arm and defining at least one arcuate ring, the arcuate ring being concentric to the center axis of the pipeline when the arm is in the first operating position and spaced from the pipeline when the arm is in the second installation position to allow the apparatus to be installed and removed from the pipeline; and
at least one spray nozzle mounted on the arcuate ring.

4,953,497
APPARATUS FOR COATING CONTINUOUS WEBS

Hans Kessler, Hanau, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,263
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726113
Int. Cl.[5] C23C *14/00*
U.S. Cl. 118—718 4 Claims

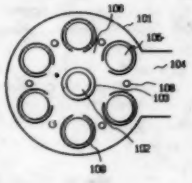


1. An apparatus for vacuum coating continuous web materials comprising a housing, a removable cover disposed on at least one side of said housing for the hermetic closure of same, winding means comprising pulley cylinders, tension measuring cylinders, stretching cylinders and tightening cylinders journaled between two plates, plus at least one coating cylinder, means for coating said web held stationary in said housing and positioned along the web path between said feed roll and said take up roll, at least one take-up roll, at least one feed roll and at least one fresh roll, said two plates containing therebetween said cylinders and said rolls, being so arranged to form a unit, said unit being capable of traveling on rolling means on tracks, thereby enabling the loading and unloading of said apparatus, with the result that all of said cylinders and said rolls are freely accessible from without said housing; and transport means which can move transversely to said tracks used in conjunction with said unit, said transport means being provided with pairs of arms journaled on said rolling means, the common pivot axis of said pairs of arms being disposed parallel to said tracks, and the free ends of said pairs of arms being equipped with supporting eyes for holding one fresh roll and one take-up roll.

4,953,498
MICROWAVE PLASMA CVD APPARATUS HAVING SUBSTRATE SHIELDING MEMBER

Junichiro Hashizume, Ueno; Tetsuya Takei; Shigehira Iida, both of Kaya; Keishi Saitoh, Nabari, and Takayoshi Arai, Ueno, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 403,990, Sep. 7, 1989, abandoned, which is a continuation of Ser. No. 173,606, Mar. 25, 1988, abandoned. This application Feb. 7, 1990, Ser. No. 477,123
Claims priority, application Japan, Mar. 27, 1987, 62-73562; Mar. 10, 1988, 62-57297
Int. Cl.[5] C23C *16/50*
U.S. Cl. 118—719 7 Claims



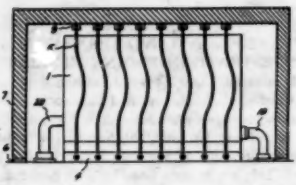
1. In an apparatus for the formation of a functional deposited film on a plurality of cylindrical substrates by means of microwave plasma chemical vapor deposition, said apparatus having a cylindrical deposition chamber with a center longitudinal axis and comprising a circumferential wall having an end portion thereof provided with a microwave introducing window to which a waveguide extending from a microwave power source is connected, said cylindrical deposition chamber having a plasma generation space and plurality of rotatable cylindrical substrate holders therein, each of said substrate holders capable of having one of said cylindrical substrates positioned thereon, said rotatable cylindrical substrate holders being concentrically arranged in said cylindrical deposition chamber substantially parallel and equidistant from said center longitudinal axis of said deposition chamber, said cylindrical deposition chamber being provided with means for supplying a film-forming raw material gas into said plasma generation space and means for evacuating said cylindrical disposition chamber, the improvement with comprises a cylindrically shaped shielding member made of a material selected from the group consisting of aluminum, nickel, stainless steel, ceramics, and heat-resistant polymer, said shielding member positioned so as to be adjacent to each of said cylindrical substrates while maintaining a constant distance between said shielding member and each of said cylindrical substrates in said plasma generation space, said shielding member being provided with a plurality of openings, each of said openings being directed to one of said cylindrical substrates and each of said openings being longitudinally situated along one of said cylindrical substrates so as to allow active species capable of contributing to the formation of a deposited film generated in said plasma generation space to pass through said openings toward the cylindrical substrate.

4,953,499

APPARATUS FOR SYNTHETIC DIAMOND DEPOSITION INCLUDING CURVED FILAMENTS AND SUBSTRATE COOLING MEANS

Thomas R. Anthony, Schenectady; Robert C. DeVries, Burnt Hills; Richard A. Engler; Robert H. Ettinger, both of Schenectady, and James F. Fleischer, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1989, Ser. No. 389,212
Int. Cl.[5] C23C *16/46*
U.S. Cl. 118—724 6 Claims



1. Apparatus for deposition of diamond on substrates by chemical vapor deposition, comprising:

a closed reaction chamber having at least one gas inlet and at least one exhaust means, said chamber being capable of being maintained at a pressure below atmospheric;

support means for supporting said substrates in said chamber parallel to each other and spaced apart to permit gas flow between said substrates;

resistance heating means comprising a plurality of vertically extending linear, electrically conductive filaments prestressed to curve in a single plane substantially equidistant from and parallel to said substrates, each of said filaments being fixedly secured at each end to a pair of fixed electrodes; and

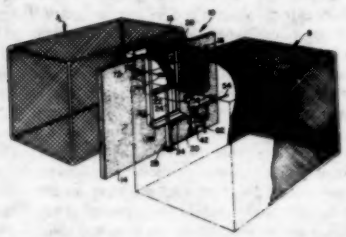
substrate cooling means situated adjacent one of said substrates on the opposite side from said filaments.

4,953,500

DOOR SYSTEM FOR LARGE PRIMATE CAGING

E. Sue Savage-Rumbaugh; Duane M. Rumbaugh, both of Ellenwood, Ga.; Samuel O. Smith, Apex, N.C., and Michael B. Smith, Lilburn, Ga., assignors to Emory University, Atlanta, Ga.

Filed Dec. 7, 1988, Ser. No. 281,260
Int. Cl.[5] A01K *1/00, 1/08*
U.S. Cl. 119—17 3 Claims



1. A primate door system for an opening separating two areas comprising:

(a) a door movable between a first position to close said opening and a second position to open said opening;

(b) a piston having a distal end that is connected to said door;

(c) a hydraulic cylinder having said piston slidable therein;

(d) a source of fluid;

(e) a control cylinder located between and in fluid communication with said hydraulic cylinder and said source of fluid, wherein said control cylinder comprises a spool valve in said control cylinder that is connected to said electrical switching system; and

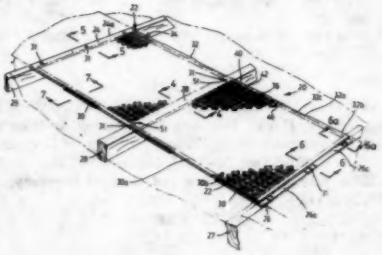
(f) an electrical switching system connected to said control cylinder to selectably direct fluid into and out of said hydraulic cylinder to act upon said piston so as to move said door between said first and second positions, wherein said electrical switching system comprises a solenoid electrically connected to said spool valve; at least two electrical door switches, at least one of said switches being located in each one of said areas, said door switches operable by said primate and being connected to said solenoid; a timer and relay system in line with said solenoid and said door switches; a master switch in line with said door switches and said timer and relay system, a cut-off switch located between said door switches and said timer and relay system, said cut-off switch operable by the caretaker for said primate to render selectively inoperable said door switches and a source of electrical current operably connected to said solenoid, said door switches, said master switch, said timer and relay system and said cut-off switch.

4,953,501

FLOORING UNIT

Pierre A. Moreau, Calgary, Canada, assignor to BCM Manufacturing Ltd., Calgary, Canada

Filed Mar. 23, 1989, Ser. No. 327,838
Int. Cl.[5] A01K *1/00*
U.S. Cl. 119—28 19 Claims



1. A flooring unit for an animal enclosure, being of relatively thin and flat rectangular shape overall for mounting between substantially parallel joist means and defining:

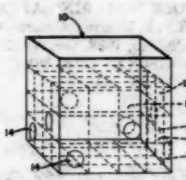
a planar tread surface;

two elongated mounting members being disposed at respectively opposite ends of the unit and extending over substantially the entire width of the unit, each mounting member including a portion adapted to overlap a corresponding portion of a complementary mounting member whereby two flooring units can be arranged end-to-end with complementary mounting members fitted together and overlapping one another to define a mounting area, each mounting member including fastener receiving means, the fastener receiving means being located such that when a portion of a mounting member overlaps a corresponding portion of a complementary mounting member the fastener receiving means of the portions are aligned to receive a single fastening element to be driven into a joist means therebelow;

two elongate engagement members disposed at opposite sides of the unit and having shapes which are complementary to each other so that two flooring units can be arranged side-by-side with the complementary engagement members fitted together; and

a grid-like area between said member including openings through which waste material can pass.

4,953,502
THREE-DIMENSIONAL MAZE PET TOY
Judith L. Hoover, 3108 Killian Rd., Uniontown, Ohio 44685
Filed Sep. 21, 1989, Ser. No. 410,256
Int. Cl.[5] A01K *15/00*
U.S. Cl. 119—29 **17 Claims**

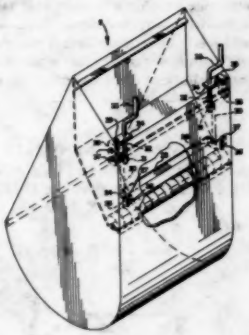


1. A three-dimensional maze for small animals comprising:
a containment structure with at least one open end for accessing maze elements and cleaning, and at least one aperture large enough to accommodate the passage of a small animal;
a plurality of maze elements encased in said containment structure, said maze elements further comprising a plurality of grid elements, said grid elements containing an indeterminate number of apertures large enough to accommodate a small animal;
a first means for altering the maze wherein the grid elements are interchanged; and
a plurality of planar surfaces which separate the maze elements.

4,953,503
WINDOW-MOUNTED BIRD FEEDER APPARATUS
Timothy Lundquist, P.O. Box 386A, Tivoli, N.Y. 12583
Filed Jan. 3, 1989, Ser. No. 292,900
Int. Cl.[5] A01K *39/01, 39/04*
U.S. Cl. 119—51.01 **1 Claim**

1. In combination with window-mounted bird feeder apparatus comprising suction cups attachable to respective window panes divided by at least one mullion, a feeder body having a front side accessible to birds and a rear adapted to face the window panes, and hanger means projecting from said rear side, improved mounting brackets comprising
(a) at least two flat elongated rigid members each spanning at least two of said panes across the mullion;
(b) hanger receiving means on each of said rigid members for removably holding the feeder body;
(c) a plurality of suction cup mounting holes in each of said rigid members; and
(d) suction cup support means secured to said mounting holes for affixing the suction cups to the associated rigid members with the rigid members spanning the panes across the mullion, each of said support means comprising
(i) screw means extending through the mounting hole into securing engagement with the associated suction cup, and
(ii) a spacer cylinder around the screw means between the rigid member and the suction cup.

4,953,504
ANIMAL FEEDER
Ian A. Taylor, Quincy, Ill., assignor to Moorman Manufacturing Company, Quincy, Ill.
Filed Jan. 23, 1990, Ser. No. 468,642
Int. Cl.[5] A01K *5/01*
U.S. Cl. 119—54 **8 Claims**



1. In an animal feeder for individual animal self-regulated release of free flowing particulate animal feed from an elevated feed supply hopper into a subjacent feed trough and comprising a generally vertical rear wall, opposed side walls, a feed trough extending between said sidewalls and joined at its rear to the bottom portion of said rear wall, an at least in part inclined hopper wall extending between said sidewalls with its bottom edge forming in cooperation with the opposing juxtaposed portion of said rear wall a generally horizontal elongated feed outlet slot which extends longitudinally between said sidewalls, and animal actuatable slot closing means, the improvement wherein said slot closing means comprises
a plurality of relatively short tubular segments within said hopper and resting in end-to-end slot-closing and elongated tube-forming relationship in said elongated slot, a rod resting loosely within said tubular segments and extending between the opposing end segments, and a generally horizontal segment restraining member mounted above said tubular segments in position to limit lifting of said segments, said rod and restraining member cooperating to maintain said tubular segments in their said end-to-end relationship.

4,953,505
SAFETY DEVICE FOR CHICKS IN AUTOMATIC POULTRY FEEDERS
Peder Lia, Hvittingfoss, Norway, assignor to Modum Stiger a.s., Vikersund, Norway
Filed Feb. 1, 1989, Ser. No. 304,647
Claims priority, application Norway, Feb. 1, 1988, 880424
Int. Cl.[5] A01K *39/014*
U.S. Cl. 119—57.2 **15 Claims**

1. A safety device for chicks in an automatic poultry feeder, said automatic poultry feeder having a feed trough and a feed chain for movement in said feed trough, said safety device comprising:

a downstream roller;

an upstream roller positioned upstream of said downstream roller with respect to the direction of travel of said feed chain;

means for supporting said rollers such that said rollers are in contact with one another and such that said downstream roller can be driven by said feed chain, whereby movement of said feed chain drives said downstream roller and said downstream roller drives said upstream roller so that the upstream roller can eject any chick on said feed chain.

4,953,506

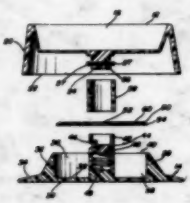
FEED BOWL FOR ANIMALS

Daniel T. Sanders, 1834 McJenkin Dr., NE., Atlanta, Ga. 30345

Filed Apr. 21, 1988, Ser. No. 184,437

Int. Cl.[5] A01K *5/00*

U.S. Cl. 119—61 **4 Claims**



1. Apparatus adapted for being placed on a support surface for feeding an animal, such as a pet dog or cat, comprising:

an upper bowl portion including an upper recess therein for receiving food or water;

a lower base portion removably attached to said top bowl portion, said lower base portion including a generally circular recess formed in an upper part thereof;

coupling means secured to said upper bowl portion and said lower base portion interconnecting said upper and lower portions together and elevating the upper bowl portion above the support surface, including a pair of centrally located generally cylindrical post members which telescope together and are respectively secured to said upper bowl portion and said lower bowl portion, said post members comprising a male type post member secured to the underside of said upper bowl portion and a female type post member secured to and located within the recess of the lower base portion;

a generally flat, relatively thin replaceable disk located in the circular recess of said lower base portion, said disk including an annular moat region of generally sticky material on the outer surface thereof surrounding said coupling means for inhibiting the travel of crawling insects across said annular region and thus preventing the insects from gaining access to the upper bowl portion;

a cylindrical sleeve fitted over said female post member abutting said disk and holding said disk in place in said recess of the lower base portion;

means locking said male and female post members together including an elongated pin extending through and outwardly from said male post member a predetermined distance to provide a pair of exposed end portions and a pair of notched grooves in the top portion of said female post member, said end portions removably engaging said notched grooves to thereby provide a bayonet type of connection, said end portions also retaining said cylindrical sleeve adjacent the disk and thereby holding the disc within the circular recess.

4,953,507

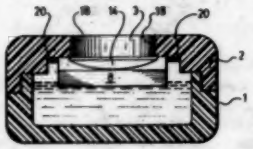
LIVESTOCK WATERING APPARATUS

S. Eric Robinson, R.R. 2, Wiarton, Ontario, Canada N0H 2T0

Filed Jun. 15, 1988, Ser. No. 207,642

Int. Cl.[5] A01K *7/00*

U.S. Cl. 119—73 **5 Claims**



1. A livestock watering device, comprising:

an insulated tank for receiving water from a water supply, said tank having a bottom, a top, and sidewalls;

at least one opening through said top whereby an animal may gain access to water in the tank;

beneath each said at least one opening, at least one horizontally arranged buoyant door having an upper surface and an underside, said at least one door being pivotally connected at one side thereof to the underside of said top adjacent to said at least one opening, for swinging up and into or down and away from said at least one opening, the upper surface of each said at least one door having a flat periphery along the pivotally connected side and adjacent sides of the door, for engaging the underside of the top of the tank adjacent said at least one opening, and a scooped central portion falling away from said flat periphery to a low point at an edge opposite said pivotally connected side so as to drain water away from said periphery, a small gap into the tank being provided in the area of said low point of the scooped portion, whereby water may drain from the upper surface of the at least one door into said tank, said flat periphery of said at least one door being set back horizontally from said at least one opening, such that the entire portion of said at least one door directly beneath the opening is scooped and thus lower than said flat periphery, thereby draining water towards said gap; and

an automatic valve means responsive to the water level in said tank for connection to said water supply for maintaining the water level in said tank at a level sufficient to hold each said at least one door closed by buoyancy.

4,953,508

BOILER FOR STEAM FLATIRONS, INCORPORATING AN IMPROVED REPLENISHMENT MANIFOLD

Giuseppe Giannelli, Olgiate Comasco, Italy, assignor to Micromax S.p.A., Como, Italy

Filed Feb. 24, 1989, Ser. No. 315,099

Claims priority, application Italy, Feb. 24, 1988, 19514 A/88

Int. Cl.[5] F22D *33/00, 5/26*

U.S. Cl. 122—7 R **6 Claims**

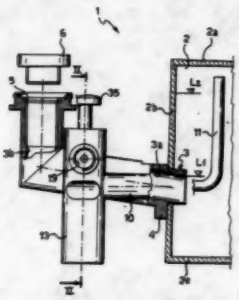
1. A boiler for steam flatirons comprising:

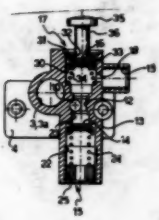
a closed receptacle having side walls, a top wall and a base wall;

a replenishment manifold disposed in communication with said receptacle and having two tubular sections, a first

tubular section having an outlet end in said receptacle at an intermediate location between said base wall and said top wall and a second tubular section connected to said first tubular section and having an inlet end at a level between said intermediate location and said top wall;

a steam delivery manifold comprising a tubular section extending into said receptacle and having a free end located at a level between said top wall and a level coplanar with said inlet end of said second tubular section of said replenishment manifold; and





a normally closed manually operated valve means for venting said receptacle whereby upon supplying water to said receptacle through said replenishment manifold with said valve means closed, the water will rise only to said intermediate location and upon supplying water to said receptacle through said replenishment manifold with said valve means open, the water will rise to said level of said inlet end of said second tubular section of said replenishment manifold.

4,953,509

FORCED-CIRCULATION STEAM GENERATOR

Manfred Klein, Oberhausen, Fed. Rep. of Germany, assignor to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

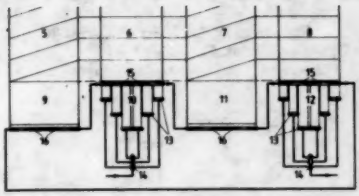
Filed Jun. 29, 1989, Ser. No. 373,992

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1988, 3822804

Int. Cl.[5] F22B *37/00*

U.S. Cl. 122—6 A **5 Claims**

1. A forced-circulation steam generator comprising: a combustion chamber having a cone; said combustion chamber having piping walls with at least partly slanting pipes; said cone having piping walls with upright pipes; separating header means separating the pipes in said combustion chamber from the pipes in said cone and forming a separating plane; a flow medium from the pipes in said cone to the pipes in said combus-



tion chamber having uniform enthalpy in said separating plane due to said separating header means.

4,953,510

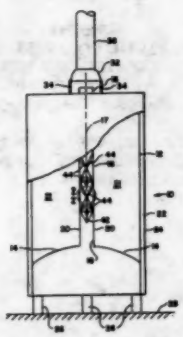
APPARATUS AND METHOD FOR HEATING WATER

Marc W. Akkala, New Berlin, and Kenneth R. Walther, Milwaukee, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Aug. 17, 1989, Ser. No. 395,031

Int. Cl.[5] F22B *5/00*

U.S. Cl. 122—17 **16 Claims**



1. An improved apparatus for exchanging heat between a first fluid retained within said apparatus and a second fluid flowing through said apparatus, said apparatus comprising:

a storage tank for retaining the first fluid,

a flue means passing in heat exchange relationship with the first fluid in said storage tank, the first fluid being in heat transfer contact with a first surface of said flue means, and the second fluid flowing through said flue means being in heat transfer contact with a second surface thereof; and

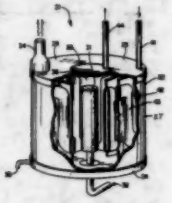
flow control means disposed within said flue means for directing said second flowing fluid toward said second surface of said flue means when heat exchange is desired between the first and second fluids, and for directing said second flowing fluid away from said second surface of said flue means when heat exchange between the first and second fluids is undesirable.

4,953,511

CORROSION RESISTANT LIQUID HEATING MODULE

John K. Boah, Manlius; Charles T. Cooney, Jr., Syracuse; Stephen A. Schoch, Clay, and Howard W. Sibley, Baldwinsville, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 22, 1989, Ser. No. 454,886
Int. Cl.[5] F22B *5/02*
U.S. Cl. 122—18 3 Claims



1. A condensing heating module for heating a fluid adapted for use with a radiant infrared burner comprising:

an enclosure having a clamshell heat exchanger spirally disposed about a central burner cavity and an external flue for gases of combustion produced by said burner to exit said module;

said heat exchanger having an inlet for fluid to be heated to enter and an outlet for heated fluid to exit;

said heat exchanger having a corrosion resistant metal section coextensive with said central burner cavity and a noncorrosion resistant metal section; and

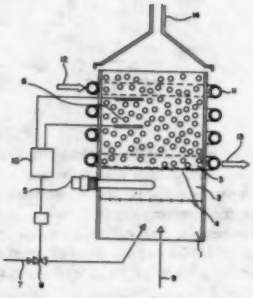
a coating of a corrosion resistant plastic material bonded to said noncorrosion resistant metal section of said heat exchanger.

4,953,512

METHANE CATALYTIC COMBUSTION BOILER FOR OBTAINING HOT WATER FOR HOUSE-HOLD AND INDUSTRIAL USES

Pietro Italiano, Cernusco Sul Naviglio, Italy, assignor to GRIV S.r.l., Milan

Filed Jul. 28, 1989, Ser. No. 386,195
Claims priority, application Italy, Jul. 29, 1988, 21568 A/88
Int. Cl.[5] B09B *3/00*; F22B *1/00*
U.S. Cl. 122—4 D 6 Claims



1. Methane catalytic combustion boiler for obtaining hot water for household and industrial uses by catalytic complete combustion of the methane contained in an air/methane mixture fed to it, said mixture containing oxygen in an amount corresponding at least to the stoichiometric amount necessary for said complete combustion of methane, comprising

a catalyst container containing a non-fluidized bed of a catalyst consisting of a metal oxide or a mixture of metal oxides selected from the group of the oxides of Cr, Mn, Fe, Co, Ni, Cu, Sn and Zn maintained at a temperature of less than 750° C.;

a metal heat-sink means supported on the outer surface of said catalyst container for heat exchange between the combustion gases and the water to be heated;

an electrical ignition system placed near the inlet of said air/methane mixture for starting the methane combustion; and

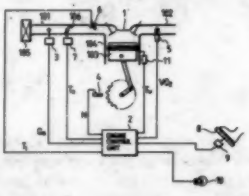
one or more thermocouple means sunk in the catalyst bed which signal a system blocking the methane feed if the temperature falls below the ignition limits of said air/methane mixture.

4,953,513

ENGINE CONTROL APPARATUS

Masahiro Sasaki; Osamu Abe, and Hideaki Ishikawa, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering, Inc., Ibaraki, both of, Japan

Filed Mar. 10, 1989, Ser. No. 321,383
Claims priority, application Japan, Mar. 12, 1988, 63-57355
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—489 19 Claims



1. In an engine control apparatus in which a basic fuel injection pulse width is calculated based on data outputs from various sensors provided for an engine, said basic fuel injection pulse width is corrected by various factors determined on the basis of detected engine conditions including the addition of a fuel increment for acceleration, and a fuel injector provided for the engine is controlled on the basis of the corrected fuel injection pulse width, the improvement comprising means for detecting an acceleration degree of the engine, means for detecting the length of a period of time from a time the time is controlled to accelerate, at which time the air-fuel ratio changes into a lean state, until a time the air-fuel ratio changes into a rich state, means for selecting a reference value of a period of time optimum to the detected acceleration degree from a plurality of reference values of a period of time each of which is determined in advance as a time period for change of the air-fuel ratio from a lean state to a rich state according to a respective acceleration degree, and means for correcting said fuel increment for acceleration so that the detected length of the period of time will converge on a selected reference value representing an optimum period of time capable of imparting an optimum acceleration to the engine for a detected deceleration degree.

4,953,514

DEVICE FOR THE METERED SUPPLYING OF FUEL VAPOR INTO THE INTAKE PIPE OF A COMBUSTION ENGINE

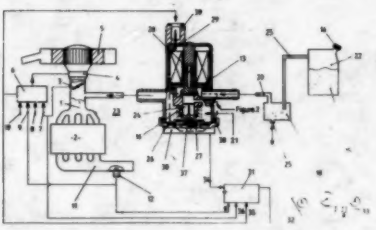
Bernd Beicht, Gross-Umstadt; Reinhard Tinz, Gross-Bieberau, and Joachim Heinemann, Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/-Bergstr., Fed. Rep. of Germany

Filed Sep. 8, 1989, Ser. No. 404,857

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830722

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—520 **12 Claims**



1. Device for the temporary storage and metered supply of fuel vapor from a fuel tank system to a combustion engine, said fuel tank system comprising a fuel tank having a free space therein, a deaeration pipe connecting said free space to the surrounding atmosphere, and a storage chamber having an absorptive element incorporated in said deaeration pipe, said device being located between said storage chamber and said engine and comprising

an electromagnetic stop valve,

a control chamber disposed serially between said stop valve and said engine,

an auxiliary valve disposed in said control chamber to change the metering capacity of the stop valve,

a bypass provided parallel to said auxiliary valve, said bypass having an adjustable cross-section, and

vacuum control means for controlling the position of the auxiliary valve, said vacuum control means being responsive to the differential pressure between the control chamber and the atmosphere.

4,953,515

DIESEL ENGINE SECONDARY FUEL INJECTION SYSTEM

William A. Fehr, 2957 Pinewood Avenue, Prince George, British Columbia, Canada V2N 1J1, and Brian G. Buck, S.S. #E, Haldi Road, Prince George, British Columbia, Canada V2N 2S7

Filed Nov. 28, 1988, Ser. No. 277,083

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—526 **3 Claims**

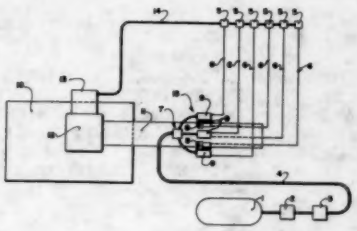
1. A method of operating a turbo-charged diesel engine, comprising the steps of:

(a) controllably injecting pressurized diesel fuel into said engine;

(b) coupling a plurality of pressure sensors to said engine turbo-charger, said sensors for sensing the boost pressure output of said engine turbo-charger;

(c) coupling an equal plurality of normally closed valves between said engine and a secondary fuel reservoir, said valves being openable in response to applied signals to allow said secondary fuel to flow to said engine;

(d) adjusting each of said sensors to detect a selected turbo-charger boost pressure within a pressure range, such that each of said sensors produces an output signal when said engine turbo-charger boost pressure is increased to said corresponding selected boost pressure, and such that said plurality of sensors together produce a plurality of output signals distributed within said pressure range; and,



(e) applying said output signals to corresponding ones of said valves,

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4,953,516

INTELLIGENT CONTROL OF MOTOR VEHICLE GAS EQUIPMENT

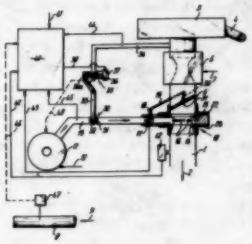
Jouke van der Weide, Rijswijk, and Adrianus J. T. Hoogeboom, Harmelen, both of Netherlands, assignors to Necam B.V., Utrecht, Netherlands

Filed Jun. 12, 1989, Ser. No. 364,319

Claims priority, application Netherlands, Jun. 17, 1988, 8801554

Int. Cl.[5] F02M *21/02*

U.S. Cl. 123—527 **5 Claims**



1. In a device for the control of a carburetor unit for a gaseous fuel, for an internal combustion engine, comprising a vaporizer/pressure regulator for the supply of gas at a pressure near the air pressure upstream of the carburetor unit, a venturi type mixing device for mixing the gas with combustion air sucked in by a said internal combustion engine, a connecting line for connecting the vaporizer/pressure regulator to said mixing device, a main throttle valve for the intake of combustion air to control the engine output, said main throttle valve being adapted to be coupled to an accelerator pedal and being situated upstream of said mixing device, and a regulating valve in said connecting line for regulating the quantity of gas supplied to the mixing device, said regulating valve being coupled to said main throttle valve; the improvement comprising a mixing air supply device in said connecting line between said vaporizer/pressure regulator and said regulating valve, said supply device comprising a further venturi and an annular channel having a throat through which said gas flows between said vaporizer/pressure regulator and said regulating valve, a mixing air supply pipe that supplies air to said air supply device, said further venturi sucking said mixing air into said annular channel, a mixing air regulating valve in said mixing air supply pipe, the first-mentioned regulating valve being so dimensioned as to be adapted to supply too rich a gas/air

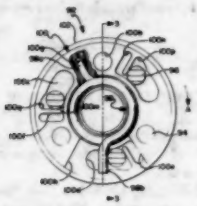
mixture to the engine, and correction means controlling the opening of said mixing air regulating valve to dilute said gas with mixing air, thereby to supply to the engine a leaner gas-/air mixture.

4,953,517

TORSION DAMPING MECHANISM FOR A SUPERCHARGER

Kevin M. McGovern, Dearborn Heights, and Robert C. Schoenhals, Davisburg, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 14, 1989, Ser. No. 339,332
Int. Cl.[5] F02B *33/38*
U.S. Cl. 123—559.1 **30 Claims**



1. A torsion damping mechanism adapted to be rotatably interposed between first drive means rotatably driven in one direction by torque from a periodic combustion engine and second drive means for driving a first gear in constant mesh with a second gear; the mechanism characterized by:

annular means disposed for rotation about an axis and fixed to one of the drive means, the annular means including a plurality of circumferentially spaced apart and generally arcuate-shaped slots each having first and second ends respectively defining stops in the one direction and in the opposite direction of rotation;

axially extending pins each having one end loosely received by one of the slots and the other end fixed to the other drive means;

a first spring means for drivingly interconnecting the other drive means and the annular means, and operative in a static state of the mechanism to position the pins closer to the second stops than to the first stops; and

second spring means fixed at one end to the annular means and having a free end extending radially in cantilever fashion into at least one of the slots, said second spring means interposed between the second stop of the one slot and the pin therein and circumferentially spaced closer to the second stop than the first stop.

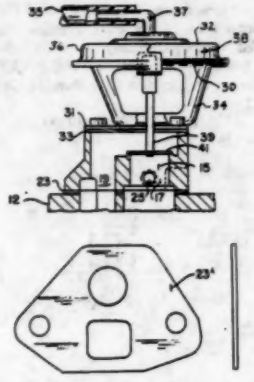
4,953,518

EXHAUST GAS RECIRCULATION VALVE

Robert F. Killion, Florissant, and Michael J. Wolfe, Villa Ridge, both of Mo., assignors to Tomco Incorporated, St. Louis, Mo.

Filed Apr. 14, 1989, Ser. No. 339,193
Int. Cl.[5] F02M *25/07*
U.S. Cl. 123—568 **8 Claims**

4. An exhaust gas recirculation valve having a universal base, said base having a surface with an entrance and an exit adapted to communicate with openings in the intake manifold of an internal combustion engine of a vehicle, an enlarged cavity in said surface around at least one of said entrance and said exit, and a plurality of model-specific gaskets for individual use with said valve, each of said gaskets being sized and shaped to fit between said surface and said intake manifold, each said gasket including openings aligned with the openings



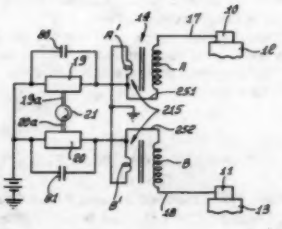
in the manifold, wherein said gaskets have differently placed openings therein, and at least some of said plurality of model-specific gaskets cover a part of said cavity in said surface of said base.

4,953,519

DUAL CONTACT IGNITION SYSTEM FOR MOTOCYCLE INTERNAL COMBUSTION ENGINE

Herbert W. Hoeptner, III, Morgan Hill, Calif., assignor to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Aug. 9, 1989, Ser. No. 391,031
Int. Cl.[5] F02P *15/02*
U.S. Cl. 123—622 **19 Claims**



1. In an ignition system for a motorcycle two cylinder internal combustion engine, the system including magnetically coupled primary and secondary coil means, spark plugs at the cylinders, a source of electrical current, and first and second pairs of contacts respectively controlling electrical current flow to the primary coil means for producing high voltage outputs from the secondary coil means to be delivered to the spark plugs, the combination comprising

(a) rotary cam means driven by the engine for controlling opening of the pairs of contacts, the cam means rotatable about a first axis,

(b) first and second carrier means respectively carrying the first and second pairs of contacts, and each adjustably rotatable about said axis, one of said first and second carrier means operatively connected to the other of said first and second carrier means for adjustment relative thereto,

(c) and non-rotary support means to which said carrier

means is connected, in adjusted positions of the first and second pairs of contacts,

(d) whereby the timing of spark effected ignitions by the spark plugs may be controlled.

4,953,520

IGNITION APPARATUS OF INTERNAL COMBUSTION ENGINE

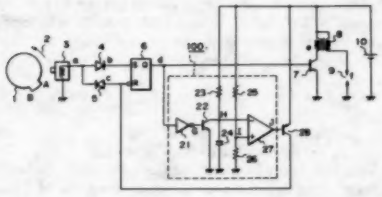
Atsushi Hashizume, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,582

Claims priority, application Japan, Oct. 14, 1987, 62-259930; Oct. 14, 1987, 62-259931

Int. Cl.[5] F02P *11/00*

U.S. Cl. 123—631 12 Claims



1. An agnition apparatus of an internal combustion engine comprising:

a sensor for generating first and second angle signals corresponding to first and second crank angles of the internal combustion engine;

a flip-flop circuit which is set or reset by the first angle signal of said sensor and is reset or set by the second angle signal of the sensor;

a transistor for controlling a primary current of an ignition coil on the basis of an output of said flip-flop circuit and for performing an igniting operation on the basis of the second angle signal;

a detecting circuit for detecting a state of the engine wherein reverse rotation is taking place; and

a circuit for inhibiting the setting or resetting of the flip-flop circuit in accordance with a detection output of said detecting circuit.

6. An ignition apparatus of an internal combustin engine comprising;

sensor means whose output level is inverted and set to a first state at a first angle position of the internal combustion engine and is again inverted and set to a second state at a second angle position;

a transistor for allowing a primary winding current of an ignition coil to be supplied or shut off on the basis of an output of said sensor means;

a detecting circuit for detecting a satate of the engine wherein reverse rotation is taking place by determining that a predetermined period of time has passed after first angle position has passed said sensor means of first time, without said second angle position passing said sensor means; and

ignition blocking means for blocking the generation of an ignition spark in a secondary output of said ignition coil in response to a detection output of the detecting circuit.

4,953,521

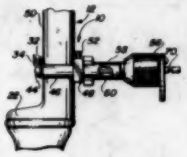
ARCHERY BOW ASSEMBLY

Vincent F. Troncoso, Montrose, Colo., and Richard Gangloff, Caliente, Calif., assignors to Golden Key-Futura, Inc., Montrose, Colo.

Filed Dec. 18, 1989, Ser. No. 452,346

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—24.1 6 Claims



1. An improved archery bow assembly, said assembly comprising, in combination:

(a) an archery bow having a pair of limbs connected to a handle riser defining an arrow window above an arrow shelf, said limbs being interconnected through a bowstring;

(b) a pendulum-type disappearing arrow rest mounted in said handle riser and extending into said arrow window, said rest comprising

(i.) a pair of forwardly extending, flexible, resilient inner and outer blades, said inner blade lying next to the sidewall of said riser defining said window and including a front arrow support adapted to project through a notch in said outer blade when said inner blade is biased outwardly, said outer blade serving as a side pressure plate for said arrow;

(i.i.) a transverse bar behind said riser connected to the rear ends of said blades;

(i.i.i.) an elongated mounting block connected to the sidewall of said riser on the side opposite said window, and projecting rearwardly behind said riser and adjustably receiving and securing said bar;

(i.v.) a tube with a central passageway therethrough, passing transversely through and secured to said block and said riser for communication of said passageway with said window;

(v.) a pin slideably disposed in said tube, with one end abutting the inner surface of said inner blade and the opposite end of said pin projecting out of said tube on the side of said riser opposite said window, said pin bearing a notch in said opposite end; and,

(v.i.) a flat pendulum plate pivotably mounted on the end of said tube adjacent said pin notch for swinging forwardly and rearwardly, said pin end passing through an opening in said plate, said pin being biasable into said tube against the spring action of said inner blade to releasably engage said p ate in said notch, thereby holding said front support in an arrow-supporting position, but being disengageable therefrom automatically in response to vibration in said bow upon release of said bowstring during shooting, whereby said front support springs back to a retracted non-supporting position for improved arrow and arrow vane clearance.

4,953,522
METHOD OF DRESSING GRINDING WHEELS IN GRINDING MACHINES

Ulrich Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 275,122, Nov. 22, 1988. This application Sep. 22, 1989, Ser. No. 410,923

Int. Cl.[5] B24B *53/053*

U.S. Cl. 125—11.01 **4 Claims**

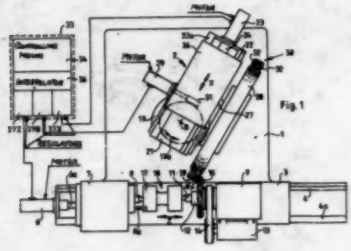


Fig. 1

1. A method of path-controlled dressing of a profiled working surface of a rotating grinding tool, which is rotatable about a predetermined axis, with a dressing tool in a grinding machine, comprising the steps of positioning the dressing tool and the grinding tool at a predetermined inclination relative to each other and contacting the working surface by the dressing tool; moving the dressing tool and the grinding tool relative to each other, in a direction of at least two axes which are inclined relative to each other, to an extent which is dependent upon the profile of the working surface while the dressing tool continues to contact the working surface; changing the inclination of the grinding tool and dressing tool relative to each other as a function of the profile of the working surface, including changing the orientation of the grinding tool, said orientation changing step including turning the grinding tool about a further axis which is remote from the point of contact between the working surface and the dressing tool; moving at least one of the tools linearly in a direction of one of said at least two axes to an extent which is a function of said orientation changing step; and compensating for deviations of movement of the grinding and dressing tools in the directions of said at least two axes during dressing of the working surface as a result of changes of orientation of the grinding tool.

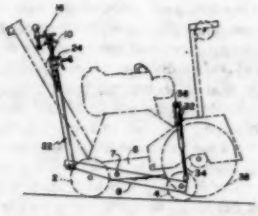
4,953,523
QUICK RELEASE MECHANISM FOR THE TOOL OF A CONCRETE/ASPHALT ABRADER

Leo Swan, Jefferson, Md., assignor to Equipment Development Company, Inc., Frederick, Md.

Filed Oct. 16, 1989, Ser. No. 421,941

Int. Cl.[5] B28D *1/00*; B24B *23/02*

U.S. Cl. 125—14 **11 Claims**



1. A quick release mechanism for retracting a cutting or abrading tool of masonry cutting apparatus from a work surface, comprising:

tool positioning means, including a cut control linkage and a screw threaded rod moveable axially to actuate the cut control linkage to engage the tool upon the work surface;

compression spring means connected to the cut control linkage, said spring means being compressed when said tool positioning means is operated to engage a tool upon the work surface; and

quick release means mounted on said cut control linkage, said quick release means including a support structure,

a separable split collar housing a first and a second collar portion, each of said collar portions having an inner surface engageable with said threaded rod, said first collar portion further being pivotally affixed to said support structure and moveable between a closed position and an open position, said inner surface of said first collar portion also being threaded and engaging threads on said threaded rod when in said closed position, said second collar portion being rigidly fixed to said support structure, said inner surface of said second collar portion being unthreaded and frictionally engaging said threaded rod, and manually operable release means attached to said first collar portion and biased to maintain said first collar portion in said closed position, said release means being operable when actuated to pivot said first collar portion away from said second collar portion to said open portion whereby said compressing spring expands to drive said cut control linkage axially upward and to disengage the tool from the work surface.

4,953,524
RADIAL PISTON ENGINE

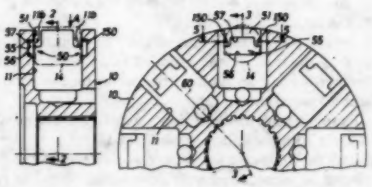
Peter Wüsthof, Lohr, Fed. Rep. of Germany, and Sinclair Cunningham, Kinghorn, United Kingdom, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

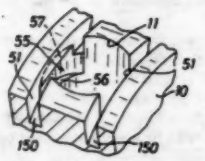
Filed Aug. 18, 1989, Ser. No. 395,720

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1988, 3828131

Int. Cl.[5] F02B *57/00*

U.S. Cl. 123—43 C **6 Claims**





1. A radial piston engine comprising:

a housing,

an annular cam disk fixedly mounted in said housing,

a cylinder block rotatably mounted about an axis with respect to said cam disk,

a plurality of bores arranged in said cylinder block in a position radially with respect to said axis of rotation,

a plurality of pistons respectively mounted in said bores, and cylindrical rollers for supporting said pistons on said cam disk, said rollers having axes which extend parallel to the axis of rotation of the cylinder block, and

wherein said bores of said cylinder block which are adapted to receive said pistons are provided with recesses in the area of movement of said rollers, so as to receive sections of said rollers on both endfaces of said rollers.

4,953,525

COOLING SYSTEM FOR V TYPE ENGINE

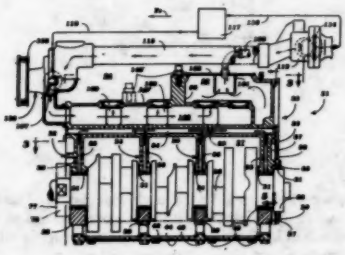
Kenichi Sakurai, and Yoshihide Takano, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 29, 1989, Ser. No. 414,679

Claims priority, application Japan, Sep. 30, 1988, 63-246136

Int. Cl.[5] F02B 75/18

U.S. Cl. 123—41.28 7 Claims



1. A cooling system for an internal combustion engine having a cylinder block with angularly disposed banks forming respective cylinder bores, said cylinder banks defining a valley therebetween, a coolant manifold passage formed in said cylinder block at the base of said valley, cooling delivery passages formed in said cylinder block for communicating said coolant manifold passage with cooling jackets surrounding said cylinder bores.

4,953,526

PORTABLE WORK MACHINE

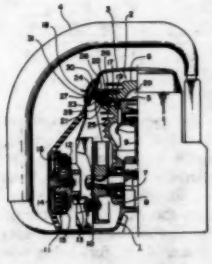
Yoshiaki Hironaka, Sayama; Tatsuhiko Matsubayashi; Yoshikiyo Kamata, both of Hachioji, and Takanobu Tasaki, Tokyo, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 405,166

Claims priority, application Japan, Oct. 5, 1988, 63-130017[U]

Int. Cl.[5] F02N 17/08

U.S. Cl. 123—182 1 Claim



1. A portable work machine comprising: an internal combustion engine disposed in the machine main body; a cover surrounding said engine; a handle capable of being manually held by the operator; a manual starter for starting said engine; a starting pressure reducing device mounted on a cylinder of said engine for reducing, at starting of said engine, pressure within a combustion chamber defined in the cylinder; a hole formed at a portion of said cover which is within reach of a finger of a hand holding said handle; and a flexible cap closing said hole, an actuating portion of said starting pressure reducing device being disposed inside said cap.

4,953,527

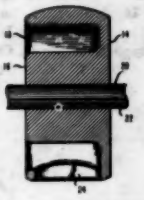
SPHERICAL ROTARY VALVE ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

George J. Coates, 2500 Belmar Blvd., Wall Township, Monmouth County, N.J. 07719

Filed Nov. 14, 1988, Ser. No. 270,037

Int. Cl.[5] F01L 7/00

U.S. Cl. 123—190 B 13 Claims



1. A spherical rotary valve assembly for use in internal combustion engines of the piston and cylinder type, said spherical rotary valve assembly comprising:

a removable two-piece cylinder head securable to the internal combustion engine, said two-piece removable cylinder head comprising an upper and lower cylinder head section, said upper and lower cylinder head section when secured to said internal combustion engine define a cavity radially aligned with the cylinders of said internal combustion engine, said cavity defining a first drum accommodating cavity and a second drum accommodating cavity for each of said cylinder of said internal combustion engine, said lower cylinder head section and said first drum accommodating cavity having an inlet port in communication with said cylinder; said lower cylinder head section and said second drum accommodating cavity having an outlet port in communication with said cylinder;

a sealing means associated with said inlet and said outlet port;

a first passageway for the introduction of a fuel/air mixture into said cylinder head by way of said first drum accommodating cavity and a second passageway for the evacuation of exhaust gases from said cylinder by way of said second drum accommodating section;

a shaft means journaled on bearing surfaces within said cavity of said removable two-piece cylinder head, said shaft having positioned thereon a first drum in said first drum accommodating cavity and a second drum in said second drum accommodating cavity for each said cylinder, each drum having a spherical section defined by two parallel planes of a sphere, the planes being disposed symmetrically about the center of said sphere, the intersection between the planes and the spherical section being rounded off defining a drum having a spherical periphery and planer end walls; said shaft means occupying said journaled bearing surface in said cavity in gas tight sealing contact, each of said drums occupying said drum accommodating cavity in gas tight sealing contact with said inlet

port and said outlet port in said lower cylinder head section and in isolation from each other;

said first drum interrupting said first passage for introduction of said fuel/air mixture to the engine and said second drum interrupting said second passage for evacuation of exhaust gases from said engine, wherein said shaft means and said drums are rotated at a speed related to the operating cycle of the engine such that said first drum makes successive contact with the inlet port of said cylinder and said first passageway to transfer successive charges of fuel air/mixture to the cylinder during rotation of the shaft and said second drum makes successive contact with the outlet port of said cylinder and said second passageway to evacuate successive charges of exhaust gases from the cylinder during rotation of the shaft.

4,953,528

DIRECT INJECTION-TYPE DIESEL ENGINES

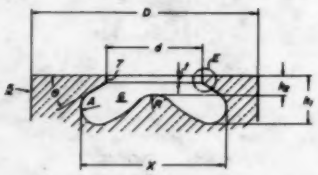
Hiroshi Ofkawa, Tokyo; Naohisa Nakashima, Kawasaki; Tadaaki Matsuhisa, Kasugai, and Tadao Ozawa, Nagoya, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and NGK Insulators, Ltd., both of, Japan

Filed Oct. 5, 1989, Ser. No. 417,545

Claims priority, application Japan, Oct. 7, 1988, 63-252157

Int. Cl.[5] F02B *3/00*

U.S. Cl. 123—276 15 Claims



1. A direct fuel injection-type diesel engine comprising: a cylinder with a predetermined bore diameter; a cylinder head on said cylinder; a piston reciprocably arranged in said cylinder and having a piston head which is formed with a combustion chamber, said combustion chamber including an inner wall surface and an opening which is opposed to said cylinder head; as well as a fuel injection nozzle fixedly mounted in said cylinder head for directly injecting fuel into said combustion chamber; said combustion chamber having said opening with a diameter which is 55% or less of said cylinder bore diameter, and having a maximum diameter which is 128% or more of said opening diameter, said inner wall surface being composed essentially of ceramic material.

4,953,529

LOAD-SHIFTING DEVICE

Manfred Pfalzgraf, Frankfurt am Main; Gerd Hickmann, Schwalbach, and Eberhard Mausner, Liederbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 28, 1989, Ser. No. 373,936

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1988, 3837162

Int. Cl.[5] F02D *11/10, 41/14*

U.S. Cl. 123—396 10 Claims

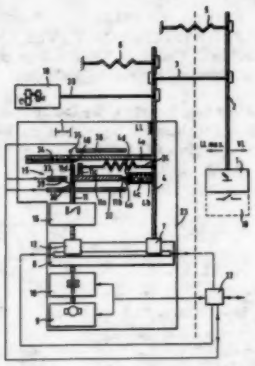
1. A load-shifting device for a motor vehicle, the device having a regulating element for acting on a setting member which determines the output of an internal combustion engine, the load shifting device comprising

a driver which is coupled to an accelerator pedal of the motor vehicle;

an electric setting drive with a desired-value detection element and an actual-value detection element operatively coupled to the electric setting drive;

an electronic control device, the electric setting drive being regulatable as a function of vehicle and engine speed values applied to the electronic control device;

a regulating element, a control device, and a space-monitoring device connected between the driver and the regulating element and wherein



said space-monitoring device, upon a deviation of said driver and said regulating element from a predetermined spacing established by the control device, feeds a space signal for the purposes of plausibility testing; and

said control device, in the absence of well-defined plausibility conditions, uncouples the electric setting drive allowing said drive and said control element to be move positively mechanically.

4,953,530

THROTTLE VALVE OPENING DEGREE CONTROLLING APPARATUS FOR INTERNAL COMBUSTION ENGINE

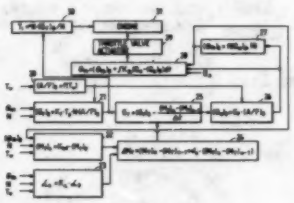
Toshio Manaka, Katsuta, and Masami Shida, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1989, Ser. No. 375,901

Claims priority, application Japan, Jul. 29, 1988, 63-188164

Int. Cl.[5] F02D *11/10*

U.S. Cl. 123—399 16 Claims



1. A throttle valve opening degree controlling apparatus for an internal combustion engine comprising a throttle valve being arranged to the internal combustion engine, an acceleration pedal being arranged to the internal combustion engine, a first actuator for controlling an opening degree of said throttle valve, and a second actuator for controlling an amount of fuel being supplied into cylinders of the internal combustion engine, in which an amount of fuel being injected is controlled electronically by an amount of an intake air for flowing into the internal combustion engine and the amount of the fuel being supplied into the internal combustion engine in accor-

dance with a data stored in a control unit and for controlling the internal combustion engine wherein

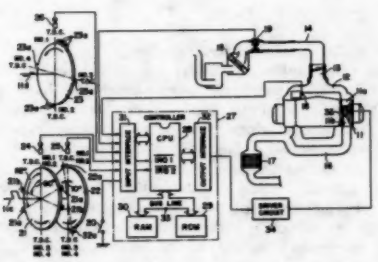
said throttle valve opening degree controlling apparatus comprises further a fuel supply amount executing means for estimating and calculating the amount being supplied in said cylinders of the internal combustion engine with a real time, and a throttle valve opening degree executing means for calculating a necessary throttle valve opening degree so as to give a predetermined air-fuel ratio in accordance with an estimating and calculating value by said fuel supply amount executing means, thereby said first actuator for controlling the throttle valve opening degree is controlled in accordance with a calculation value of said throttle valve opening degree executing means as a control target value.

4,953,531

CRANK ANGLE DETECTOR FOR AN ENGINE

Kunihiro Abe, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 412,144
Claims priority, application Japan, Sep. 27, 1988, 63-241870
Int. Cl.[5] F02P 5/15
U.S. Cl. 123—414 **2 Claims**



1. A crank angle detector for an engine having a plurality of cylinders, a crank shaft, a cam shaft, a crank angle sensor for sensing a rotational position of said crank shaft and for producing a crank pulse and a cam pulse, a starter switch for starting said engine and producing a start signal, and a controller responsive to said cam pulse and crank pulse sensed by said crank angle sensor to control ignition timing of said respective cylinders of said engine, comprising:

a pair of rotor plates having a plurality of projections on a periphery thereof for indicating said crank pulse, in which one of said plates calculates a crank angle and an engine speed, and the other of said plates indicates a fixed ignition timing at starting said engine;

a cam rotor plate connected to an end of said cam shaft, and having a projection on a periphery thereof for discriminating a cylinder number and for producing said cam pulse;

said controller operatively to control an ignition timing by said crank pulse indicating said fixed ignition timing when said engine is judged to be in a starting state in dependency on said start signal from said starter switch; and

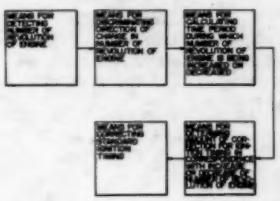
said controller having an interrupt terminal connected to an input interface therein for masking said interrupt terminal of said input interface to control an ignition timing when said fixed crank pulse is input and when said engine is judged to be in the complete firing state in dependency on an OFF state of said start signal from said starter switch.

4,953,532

IGNITION TIMING CONTROL UNIT FOR INTERNAL COMBUSTION ENGINE

Masami Nagano, and Takeshi Atago, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 336,783
Claims priority, application Japan, Apr. 15, 1988, 63-91807
Int. Cl.[5] F02P 5/04
U.S. Cl. 123—419 **8 Claims**



1. In an ignition timing control apparatus for an internal combustion engine in which surging occurs during acceleration, and in which correction means is provided for controlling said surging by correcting a fundamental value of ignition timing by adding at least one correction ignition timing value to said fundamental value when said engine speed is changing in the decreasing direction and subtracting at least one correction value from said fundamental value when said engine speed is changing in the increasing direction, the improvement comprising:

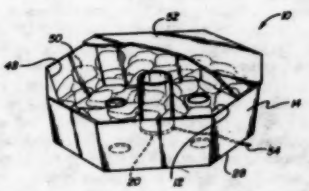
means for controlling at least one of the number and magnitude of correction ignition timing values added to and subtracted from said fundamental value by said correction means so as to provide an asynchronous correction of engine speed during periods of increasing engine speed as compared to periods of decreasing engine speed when said surging results in an asynchronous pattern of engine speed change.

4,953,533

SELF-IGNITING COMBUSTION PACKAGE

Gary L. Witt, 52499 Mound, Utica, Mich. 48087

Filed Feb. 6, 1990, Ser. No. 475,443
Int. Cl.[5] A47J 37/00; F24B 3/00
U.S. Cl. 126—25 B **16 Claims**



1. A combustible package comprising:

a substantially horizontal platform, said platform comprising an upper surface and a lower surface, a perimeter, a central aperture, and a plurality of peripheral apertures adjacent to said perimeter;

circulation means circumscribing said platform adjacent said perimeter, said circulation means being in communication with said plurality of peripheral apertures;

a chimney positioned substantially coaxial to said central aperture of said platform, said chimney extending upwardly from said upper surface of said platform, said

chimney forming a flue contiguous said central aperture; and

igniter means located beneath said platform;

whereby ignition of said igniter means produces combustion gases beneath said lower surface of said platform, said combustion gases flowing inwardly and upwardly through said central aperture and said chimney, and said combustion gases also flowing outwardly and upwardly through said peripheral apertures, thereby entering said circulation means.

4,953,534

GAS BURNER ASSEMBLY OF EXTRA FLAT TYPE

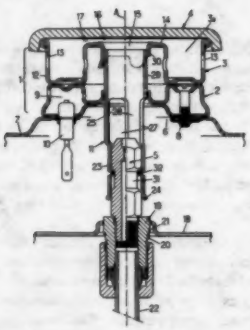
Jean-Bernard L. De Gouville, Joue-Les-Tours, and Bernard Dane, Montbazon, both of France, assignors to Sourdillon-Airindex, France

Filed Jan. 17, 1990, Ser. No. 466,614

Claims priority, application France, Jan. 20, 1989, 89 00693

Int. Cl.[5] F24C 3/00

U.S. Cl. 126—39 H 8 Claims



1. Gas burner of the extra flat type for gas appliances, particularly household appliances, which comprises:

a burner body (1) comprising an annular expansion chamber (3a) whose external sidewall (12) is formed with a multitude of flame passages (13) spaced apart circumferentially, having a central orifice (15) open downwards for the intake of a gas-air mixture into the expansion chamber, this burner body being further adapted to be fixed in an approximately axial position on the periphery of an opening (6) formed in a top plate (7) of the gas appliance,

a cap (4) covering said burner body (1) and closing said expansion chamber (3a), the facing zones of the internal face (16) of the cap (4) and of the upper face of a central plate (14) diverging radially away from each other outwardly so as to form a diffuser or annular venturi (17),

and a gas injector (5) connected to a gas intake tube (22) and disposed vertically and axially under said gas-air mixture intake orifice (15) of the burner body and at a distance therefrom, said injector being adapted to be supported by a structural element (18) of the gas appliance situated below said top plate (7), characterized,

in that it comprises a tubular member or similar (11) extending vertically and axially between the gas-air mixture intake orifice (15) of the burner body and the injector (5);

in that this tubular member (11) has a first end portion (23) which cooperates closely with the external contour of the injector(5), an intermediate portion (25) extending between the injector and the burner body and having at least one aperture (27) formed in its wall for the intake of primary air, and a second end portion (29) opposite the first one which cooperates closely with the contour of the gas-air mixture intake orifice (15) of the burner body; and in that the injector rests freely in an overdimensioned housing (20) of the structural element (18) which supports it;

whereby the injector (5) already positioned in its housing in the structural element is automatically positioned by said tubular member, coaxially with the gas-air mixture intake orifice of the burner body, during positioning of said burner body on the top plate.

4,953,535

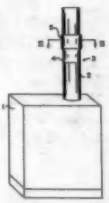
FLUE CONTROL DEVICE

Grant E. Hagan, 15915 Goggs Ave., White Rock, British Columbia, Canada V4B 2N9

Continuation of Ser. No. 281,922, Dec. 5, 1988, Pat. No. 4,850,336, which is a continuation of Ser. No. 62,864, Jun. 16, 1987, abandoned. This application Jul. 18, 1989, Ser. No. 381,293

Int. Cl.[5] F23J 11/00

U.S. Cl. 126—307 R 10 Claims



1. A flue control device comprising:

(a) a first hollow cylindrical pipe section having a first end adapted to communicate with a furnace exhaust stack;

(b) a second hollow cylindrical pipe section having a first end adapted to communicate with a furnace exhaust stack and a second end adapted to slidably receive the second end of said first pipe section;

(c) a flexible helical element mounted in the interior of said first and second pipe sections having first and second ends, an intermediate helical section between said ends, said intermediate helical section having an inner diameter providing an area of open flow of gases along the central axis of said pipe sections, and an outer diameter slightly less than the inner diameter of said pipe sections, whereby said outer diameter of said helical section is free to move relative to said inner diameter of said pipe sections;

(d) means securing the first end of said helical element to the interior surface of said first pipe section;

(e) means securing the second end of said helical element to the interior surface of said second pipe section; and

(f) means for releasably securing said first and second pipe sections in a fixed relative position.

4,953,536

WATER HEATING APPARATUS

Cedric Israelsohn, 351 Huntingdale Rd., Oakleigh South Victoria, Australia 3167, and Andrew J. Read, 683 Pretoria Main Road, Wynberg, Sandton, South Africa 2090

Filed Jul. 7, 1988, Ser. No. 216,114

Int. Cl.[5] A47J 27/00

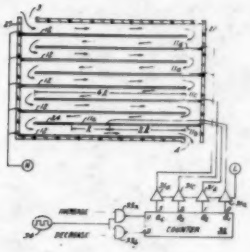
U.S. Cl. 126—374 10 Claims

1. A water heating apparatus for water having an electrical conductivity, comprising:

(a) a plurality of electrode pairs immersed in water;

(b) switching means for selectively connecting one or more of the electrode pairs to a source of electrical power whereby the water is heated by the passage of electrical current therethrough, each of the electrode pairs being configured for transmitting a different magnitude of elec-

trical power into the water relative to the other electrode pairs; and



(c) transducer means operatively responsive to the electrical current for controlling the switching means.

4,953,537

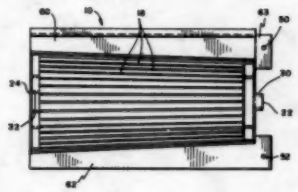
BARREL-SHAPED SOLAR ROOFING ELEMENT AND METHOD FOR IT MANUFACTURE

Joseph Allegro, Boca Ratan, Fla., assignor to Inner Solar Roof System, Inc., Boca Raton, Fla.

Filed Sep. 18, 1989, Ser. No. 408,727

Int. Cl.[5] F24J *2/04*

U.S. Cl. 126—432 **21 Claims**



1. A solar roofing element system comprising

a curved panel portion of plastic formed by injection molding having a liquid passageway therethrough and presenting an outer surface adapted for receiving solar energy constructed generally of insulative material having a relatively thin dimension between the outer surface and the liquid passageway comprising a tapered barrel-shaped construction with a smaller substantially closed end of conic section opposed to a larger substantially closed end of conic section,

and means for connecting the passageway extending throughout the panel to a solar system for processing heat exchange fluid, including

a male coupling and a female coupling at opposite ends of the passageway being adapted for interlocking of adjacent panels with the couplings when installed.

4,953,538

PIGGY BACK EVAPORATING FOR MAPLE SYRUP EVAPORATOR APPARATUS OR THE LIKE

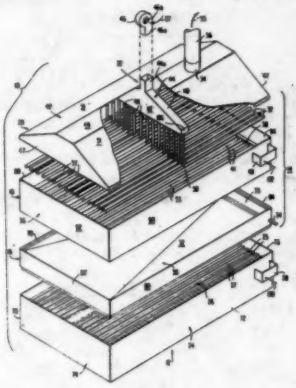
Gordon L. Richardson, R.R. #1, Box 678, and James G. Richardson, R.R. #1, Box 676, both of, Woodstock, Vt. 05091

Continuation of Ser. No. 55,225, May 29, 1987, Pat. No. 4,819,615. This application Nov. 4, 1988, Ser. No. 267,191

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] B01D *1/26; C13I 1/00*

U.S. Cl. 127—9 **4 Claims**



1. A piggy back evaporator for carrying syrup to boil off vaporizable constituents thereof said piggy back evaporator comprising:

a drip pan, an oblique condensate drain sheet extending over the major length of the same, a steam hole within said condensate drain sheet, a piggy back pan sized to and mounted to the top of the drip pan, said piggy back pan being upwardly open and including a corrugated bottom wall defining a series of laterally spaced troughs therein interiorly of the piggy back pan and a series of vertical flues on the exterior of the piggy back pan bottom wall facing said drip pan, a hood covering an open top of said piggy back pan, being sealed about edges thereof to said piggy back pan, said drip pan, said piggy back pan and said hood comprising a vertically stacked assembly, at least one steam exhaust chimney carried by said hood and extending upwardly therefrom, a plenum assembly mounted to said hood said plenum assembly including a high pressure air blower an air inlet passing through said hood and connected to said blower, a plenum chamber internally of said hood and connected to said air inlet said piggy back evaporator further comprising a plurality of downpipes projecting downwardly from said plenum chamber and opening to the interior of the plenum chamber and a plurality of sparging tubes extending the length of the piggy back pan and being connected to respective downpipes said sparging tubes being located within the bottoms of said troughs, longitudinally spaced holes within said sparging tubes, means for feeding sap to the piggy back pan of the piggy back evaporator, means for drawing off concentrate from the piggy back pan, and wherein, the capacity of the blower, the number and size of the holes within said sparging tubes, the size of said at least one steam exhaust chimney and the vertical length of said at least one chimney are such that steam condensing on the bottom wall of the piggy back pan effectively boils off the sap within the piggy back pan with significant portions of steam condensing on the undersurface of the piggy back pan due to the application of sparging air flow

via said blower, said plenum chamber and said sparging tubes to the surface of the upper side of the piggy back pan, scouring the metal surfaces of the troughs within the piggy back pan bottom wall and creating an effective frothing action with the sap to form a sap and air mixture whereby the air in passing through the sap is effectively heated and saturated with moisture with the resulting evaporation of the moisture captured by the air consuming a large quantity of heat to maintain the temperature differential between the sap and air mixture and the condensing steam under the piggy back pan at a level to insure that almost all of the steam is condensed in the area between the drip pan and the piggy back pan to increase tratih of the sap processed thereby.

4,953,539
ENDOSCOPE APPARATUS

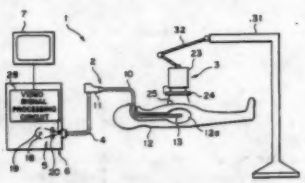
Kazunari Nakamura, Hachioji; Toshihiko Hagiwara, Hino, and Akira Takano, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 137,779, Dec. 24, 1987, abandoned, and a continuation-in-part of Ser. No. 230,820, Aug. 11, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 375,435

Claims priority, application Japan, Dec. 26, 1986, 61-313274; Dec. 26, 1986, 61-313271; Sep. 1, 1987, 62-219337; Dec. 8, 1987, 62-311297

Int. Cl.[5] A61B *1/06*

U.S. Cl. 128—6 **71 Claims**



1. An endoscope apparatus comprising:

external illuminating means for illuminating an interior of an organic body across an organic tissue of said body with an illumination light including at least infrared rays;

an elongated insert portion to be inserted into said body; and

image pickup means, having a light-receiving portion provided on said insert portion and being sensitive at least to infrared rays, said image pickup means for picking up an image of an object in or on said body formed by the illumination light emitted from said external illuminating means and transmitted through said organic tissue of said body.

4,953,540
FRAMEWORK FOR SUPPORTING SURGICAL INSTRUMENTS AT A SURGICAL WOUND

Charles D. Ray, Wayzata, and Eugene A. Dickhudt, Minneapolis, both of Minn., assignors to Surgical Dynamics, Inc., Alameda, Calif.

Continuation-in-part of Ser. No. 66,147, Jun. 25, 1987, Pat. No. 4,805,599. This application May 27, 1988, Ser. No. 199,754

Int. Cl.[5] A61B *17/02*

U.S. Cl. 128—20 **6 Claims**

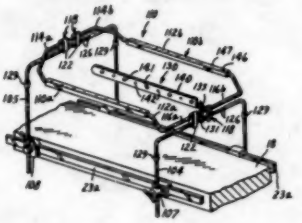
1. Framework for supporting surgical instruments at a surgical wound, said framework comprising:

a rigid frame comprising a long leg and first and second relatively short, parallel crossarms projecting substantially orthogonally from ends of the leg, each of said crossarms defining a projecting end located distally from said leg,

first and second rigid crosspieces,

means adapted for supporting the first and second crosspieces from an operating table in order for the first and second crosspieces to extend above and across a patient who is lying on the operating table,

means for releasably and rotatably attaching the projecting ends of said first and second crossarms to the first and



second crosspieces, respectively in order to support the rigid frame above and across a patient who is lying on the operating table and to allow the rigid frame to be rotatably moveable with respect to the table.

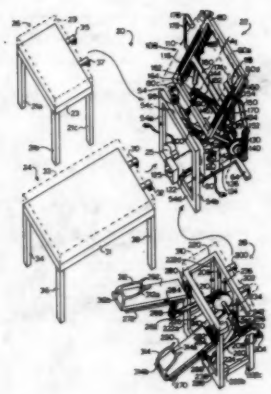
4,953,541
INTERCHANGEABLE PASSIVE EXERCISING APPARATUS

Alonzo E. Parker, Jr., 1031 Plum St., Durham, N.C. 27703

Continuation-in-part of Ser. No. 245,024, Sep. 16, 1988, Pat. No. 4,827,913. This application May 4, 1989, Ser. No. 347,466

Int. Cl.[5] A61H *1/02*

U.S. Cl. 128—25 R **10 Claims**



1. A passive exercising apparatus comprising:

(a) a first body exercising platform supported on a first frame and including means on the first frame enabling said first platform to pivot on said first frame about a first axis perpendicular to the central longitudinal axis of said first platform and to pivot about a second axis comprising the central longitudinal axis of said first platform or simultaneously pivot about both said axes;

(b) a second leg exercising apparatus on a second frame including a pair of outwardly extending leg supports pivotally supported on said second frame;

(c) connector means for detachably connecting said first and second frames together; and

(d) a drive mechanism having detachable driving means operable when said frames are connected together for driving both said first platform and said leg supports

simultaneously to cause said leg supports to pivot up-and-down in coordination with pivotal movement of said first platform about said axes.

4,953,542

DEVICE FOR TREATMENT OF SEXUAL IMPOTENCE IN HUMAN MALES

Moisei V. Tsirjulnikov, Vasilievsky ostrov, 15 linia, 14, kv. 8, and Zinovy A. Zusmanovsky, 5-ya Sovetskaya ulitsa, 34, kv. 42, both of, Leningrad, U.S.S.R.

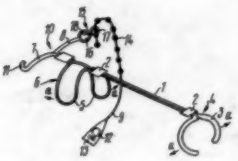
PCT No. PCT/SU87/00157, § 371 Date Sep. 26, 1988, § 102(e) Date Sep. 26, 1988, PCT Pub. No. WO88/05292, PCT Pub. Date Jul. 28, 1988

PCT Filed Dec. 28, 1987, Ser. No. 271,958

Claims priority, application U.S.S.R., Jan. 27, 1987, 4185874

Int. Cl.[5] A61F *5/41*

U.S. Cl. 128—79 **1 Claim**



1. A device for treatment of sexual impotence in human males, comprising parallel rods movably interconnected with a possibility of pivoting around their axes; a retainer of the glans penis formed of arcuate members shaped as curved plates and one of the ends of the arcuate members of said retainer being connected to each of said parallel rods; a control retainer formed of arcuate members and one of the ends of the arcuate members of said control retainer being connected to each of said parallel rods; a retainer of the penile base formed of arcuate members, first ends of the arcuate members of said retainer of the penile base being connected to each of said parallel rods and a second end of a first of said arcuate members of said retainer of the penile base having a hook; an elastic member having an eyelet of the same material as the elastic member, said eyelet interacting with said hook, and said elastic member interconnecting said arcuate members of said retainer of the penile base; and a mechanism for reversible adjustment of the degree of tension of the elastic member made as spheroid thickenings provided on the elastic member and interacting with a lock located on a second end of a second of said arcuate members of the retainer of the penile base, said lock being made as first and second holes interconnected through a recess, the diameter of said first hole exceeding the diameter of the spheroid thickenings and the diameter of the second hole being smaller than that of the spheroid thickenings.

4,953,543

CRUCIATE LIGAMENT LEG BRACE

Tracy E. Grim, Broken Arrow, Okla., and Jeffrey R. Haines, Encino, Calif., assignors to Royce Medical Company, Westlake Village, Calif.

Filed Aug. 9, 1988, Ser. No. 230,445

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—80 C **27 Claims**

14. A knee brace comprising:

an upper pair of struts;

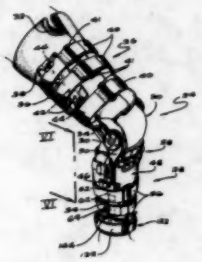
a lower pair of struts;

means for mounting said upper pair of struts on the inner and outer sides of the thigh;

means for mounting said lower pair of struts on the inner and outer sides of the lower leg;

means for pivotally connecting said upper and lower pairs of struts to simulate limited normal knee movement;

means for applying force to the tibia adjacent the knee to restrict subluxation of the tibia relative to the femur; and anti-pistoning means for preventing downward displacement of said knee brace, including means for resiliently engaging the ankle of a user immediately above the ankle bone protruberance, and mechanically supporting said brace.



4,953,544

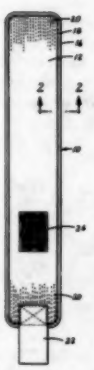
USE OF SORBENT SHEET MATERIALS AS EVAPORATIVE COOLANTS

Paul E. Hansen; Thomas I. Insley, both of Lake Elmo, Minn., and Christopher J. Libbey, St. Joseph, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 387,010, Jul. 31, 1989, Pat. No. 4,921,743. This application Jan. 19, 1990, Ser. No. 467,389

Int. Cl.[5] A61L *15/00*

U.S. Cl. 128—156 **21 Claims**



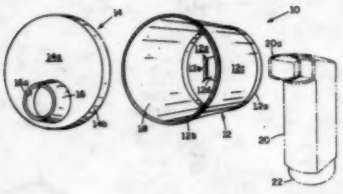
1. A method of evaporative cooling comprising

(a) wetting a sorbent sheet material comprising a web comprising fibers having an average diameter of about 1-20 microns and a solid high-sorbency liquid-sorbent polymeric material contained within said web with a liquid for which said polymeric material exhibits high-sorbency;

(b) placing said wetted sorbent sheet material in contact with the object to be cooled; and

(c) allowing said liquid contained in said wetted sorbent sheet material to evaporate while said wetted sheet material is in contact with the object to be cooled to provide a cooling effect on said object.

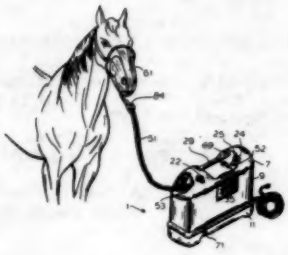
4,953,545
DISPOSABLE RESPIRATORY MEDICATION DISPERSION CHAMBER
Jerry McCarty, 8305 Windway Dr., San Antonio, Tex. 78239
Filed Oct. 18, 1989, Ser. No. 423,352
Int. Cl.[5] A61M *11/00*
U.S. Cl. 128—200.23 1 Claim



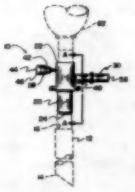
1. A disposable medication dispersion device for use with commercially available metered-dosage inhalers, comprising an elongated, tapered chamber having a second cross-section;
said chamber being constructed of plastic material;
said chamber having a flat, small end;
an insertion aperture located centrally in said small end;
said aperture having a substantially oval shape with four corners;
said aperture further having a cut at each of said corners;
said cuts permitting said aperture to accomodate various sizes and shapes of commercially available metered-dosage inhalers;
said chamber further having a large open end having an exterior edge;
said open end being covered by a removable cap;
said cap having a round, tapered mouthpiece being significantly off-set from the center of the cap;
said cap having a rim that forms a bead-like member that engages the exterior edge of the large open end of said dispersion chamber;
said chamber having a longitudinal axis that runs through the center of said small end, said cap, and said chamber;
said insertion aperture being significantly off-set relative to said longitudinal axis.

4,953,546
METHOD AND APPARATUS FOR PULMONARY AND CARIOVASCULAR CONDITIONING OF THE YOUNG OF LARGE ANIMALS
Richard H. Blackmer, Scotia, and Jonathan W. Hedman, Burnt Hills, both of N.Y., assignors to Transpirator Technologies, Inc., Somerset, N.J.
Continuation-in-part of Ser. No. 841,300, Mar. 19, 1986, which is a continuation-in-part of Ser. No. 755,562, Jul. 16, 1985, Pat. No. 4,722,334. This application Jan. 10, 1989, Ser. No. 295,656
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—203.16 11 Claims

1. A method for the therapeutic treatment of a young veterinary animal's respiratory tract comprising the step of continuously delivering to the young veterinary animal's respiratory tract a humidified stream of gas at a dew point temperature which is greater than the ambient dew point temperature at flow rates exceeding the veterinary animal's peak resting inhalation rate to condition the veterinary animal's respiratory, pulmonary and cardiovascular system.



4,953,547
DRUG ADMINISTERING ENDOTRACHEAL RESPIRATION SYSTEMS
Samuel E. Poole, Jr., 6354 Saint Andrews Cir., Fort Myers, Fla. 33919
Filed Jan. 26, 1989, Ser. No. 301,723
Int. Cl.[5] A61B *5/08*
U.S. Cl. 128—203.12 11 Claims



10. For use in a drug administering respiration endotracheal system for administering vital life-saving drugs into the lungs of a victim while maintaining the flow of life-supporting gas thereto via ventilation apparatus, the system including a gas supply; a tube for establishing gas flow exchange between the lungs of the victim and the gas supply, the tube having a proximal end and a distal end for insertion into the trachea of the victim; an improved connector, the improved connector adapted to couple the proximal end of the tube to the gas supply, the improved connector being formed as a cylinder with a gas input end, a gas discharge end and a linear axial passageway therebetween, the connector having a self-sealing hypodermic needle port coupled with a first aperture in the connector and extending into the linear passageway, the hypodermic needle port being rigid and adapted for receiving a hypodermic needle for injecting vital life-saving drugs in liquid form into the passageway for being atomized and then into the distal end of the tube intermixed with the gas, the improved connector further having a self-sealing syringe port coupled with a second aperture in the connector and extending into the linear passageway, the syringe port being rigid and adapted for receiving a syringe for injecting vital life-saving drugs in liquid form into the passageway for being atomized and then into the distal end of the tube intermixed with the gas, the axial passageway adapted for atomizing and intermixing of the life-saving drugs with the flow of life-supporting gas, the ports being located between the ends of a connector and having axes which are co-planar with respect to the axis of the connector and one port being located on the annular surface of the con-

nector substantially 180 degrees away from the other port as measured on the annular surface of the connector, the ports being as substantially right angles with respect to its longitudinal axis of the passageway.

4,953,548

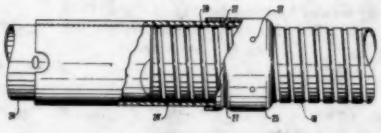
LASER RESISTANT VENTILATING DEVICE WITH LOCKING FERRULE

Philip V. Stoddard, Greenwich, N.Y.; Craig J. Bell, Winchester, N.H., and Donald R. Schneider, Cambridge, N.Y., assignors to Mallinckrodt, Inc., St. Louis Mo.

Continuation-in-part of Ser. No. 9,747, Feb. 2, 1987, Pat. No. 4,834,087. This application Nov. 3, 1988, Ser. No. 266,666

Int. Cl.[5] A61M *16/04, 25/00, 29/02;* **A62B** *9/00*

U.S. Cl. 128—207.14 **15 Claims**



1. A surgical ventilation device which is resistant to laser-caused dysfunction during laser surgery, comprising a ventilation device defining a continuous gas passageway for passage of ventilation gases during surgery, the device further comprising:

(a) a distal end for insertion into a patient's airway, the distal end defining a portion of said continuous gas passageway;

(b) a proximal end for connecting the continuous gas passageway to a source of gas;

(c) a flexible airtight metal tube connecting the distal end and the proximal end of the device, the metal tube being resistant to damage by a surgical laser and having a matte outer surface for dispersing unfocused light when a surgical laser beam is directed against said outer surface, the metal tube defining a substantial portion of said continuous gas passageway;

(d) a lower liquid-inflatable cuff comprising means for making sealing contact with the patient's trachea and means for preventing leakage of gas between the lower cuff and the trachea, and an upper liquid-inflatable barrier cuff for contacting the patient's trachea, the lower and upper cuffs connected to and longitudinally disposed along the ventilation device at approximately the distal end of the device, the trachea-sealing lower cuff being disposed between the upper cuff and the distal end, the barrier cuff providing shielding means for the sealing cuff from damage by laser energy directed toward the sealing cuff;

(e) a lower polymeric tubing assembly having an outer surface on which said lower and upper cuffs are mounted, the lower polymeric tubing assembly having a distal end which is the distal end of the ventilating device and a proximal end section within which is received a distal end of the metal tube, the ventilation device being airtight from the proximal end thereof to said cuffs on said lower polymeric tubing assembly;

(f) a locking ferrule that extends around said proximal end section of the lower polymeric tubing assembly, at least a portion of the locking ferrule being pinched inwardly so as to compress the proximal end section of the lower polymeric tubing assembly against the metal tube and thereby prevent disengagement of the lower polymeric tubing assembly from the metal tube;

(g) means for inflating the lower cuff with liquid to bring the lower cuff into sealing contact with a patient's airway to prevent leakage of gas between the lower cuff and the airway, the means for inflating the lower cuff including a first conduit disposed within the metal tube and protected thereby from laser damage, the first conduit being in communication with the lower cuff and connectable with a source of liquid for inflating the lower cuff; and

(h) means for inflating the upper cuff with liquid, bringing the upper cuff into contact with said airway, and shield the lower cuff from damage caused by laser energy directed toward the lower cuff, the means for inflating the upper cuff including a second conduit disposed within the metal tube and protected thereby from laser damage, the second conduit being in communication with the upper cuff and connectable with a source of liquid for inflating the upper cuff.

4,953,549

LIGHT RADIATOR

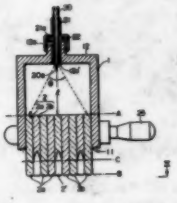
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 412,357

Claims priority, application Japan, Jan. 18, 1989, 64-19427

Int. Cl.[5] A61N *5/06*

U.S. Cl. 128—398 **5 Claims**



1. A light radiator comprising a tubular body having opposite ends, fiber optical cable means for transmitting light rays mounted on one of said ends of said tubular body, said fiber optical cable means having a light-emitting end, a plurality of parallel light-guide rods disposed at the other of said ends of said tubular body, said plurality of light-guide rods receiving said light rays transmitted from said light-emitting end of said optical cable means, said plurality of light-guide rods comprising first and second groups of light-guide rods, said first group having light-emitting ends disposed in a first plane, said second group having light-emitting ends disposed in a second plane, said first plane being located further from said one of said ends of said tubular body than said second plane, each of said light-guide rods of said first group being in contact with one of said light-guide rods of said first group being in contact with one of said light-guide rods of said second group, said light-emitting ends of said second group of light-emitting rods having a tapered concave configuration.

4,953,550

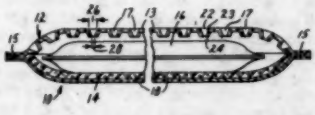
CHEMICAL THERMAL PACK HAVING AN OUTER POUCH PROVIDED WITH CAPILLARIES

Wayne K. Dunshee, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 9, 1988, Ser. No. 269,155

Int. Cl.[5] A61F *7/02*

U.S. Cl. 128—403 **23 Claims**



1. A chemical thermal pack consisting of a flexible liquid tight inner bag containing a temperature-retaining composition and a non-water absorbant insulation sheet, said inner bag

being disposed within an outer pouch constructed at least partially from a sheet of liquid impermeable material provided with capillaries each having a base in the plane of the sheet and an apex remote from said plane of said sheet.

4,953,551

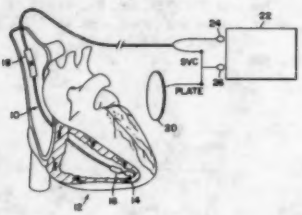
METHOD OF DEFIBRILLATING A HEART

Rahul Mehra, Stillwater, and William Combs, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 3,358, Nov. 14, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 394,249

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 D **12 Claims**



1. A method of applying electrical energy to a human heart, comprising:

implanting a first electrode having a first terminal within the ventricle of said heart;

implanting a second electrode adjacent the exterior of said heart;

implanting a third electrode remote from said heart;

electrically interconnecting said second and third electrodes, forming an electrode pair having a second terminal; and

discharging a capacitor between aid first and second terminals for a first predetermined time period, followed by reversing the polarity of said capacitor with respect to said first and second terminals, then discharging said capacitor between said first and second terminals for a second predetermined time period, forming an asymmetrical biphasic pulse waveform.

4,953,552

BLOOD GLUCOSE MONITORING SYSTEM

Arthur P. DeMarzo, 2S558 White Birch La., Wheaton, Ill. 60187

Filed Apr. 21, 1989, Ser. No. 341,429

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—635 **26 Claims**

1. A blood glucose monitoring system, comprising:

a patch having a top surface, an underside and being configured for removable attachment to the skin of a patient;

a needle type glucose sensor being secured to said patch and having a needle electrode depending from said patch underside so as to penetrate the skin of the patient;

a second electrode secured to said patch and having a surface exposed on said underside of said path to permit electrical contact with the skin;

a pair of structurally distinguishable electrode connectors secured to said patch, exposed at said top surface of said patch and connected to said needle electrode and said second electrode, respectively.

processing means having a display, and positive and negative leads, each said lead having a lead end attachment positively and releasably connected only to a corresponding one of said electrode connectors, said processing means being programmed for receiving signals from said needle electrode, for calculating an average current value over a specified time period, for converting said current value into blood glucose and for displaying said value on said display.

4,953,553

PRESSURE MONITORING GUIDEWIRE WITH A FLEXIBLE DISTAL PORTION

William S. Tremulis, Redwood City, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed May 11, 1989, Ser. No. 350,500

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—637 **10 Claims**

1. A guidewire which facilitates advancing a catheter within a patient's vasculature and which allows fluid pressure at the distal extremity of the guidewire to be determined from the proximal end thereof, comprising:

(a) an elongated tubular member having an inner lumen extending essentially from the proximal end to the distal end thereof;

(b) a relatively short flexible plastic tubular member which is secured by the proximal end thereof to the distal end of the elongated tubular member, which has an inner lumen in fluid communication with the inner lumen of the tubular member and which is provided with at least one pressure monitoring port;

(c) a core member which extends distally through at least a portion of the flexible plastic tubular member and which is secured to the flexible tubular element; and

(d) a flexible coil disposed about and secured to the core member.

4,953,554

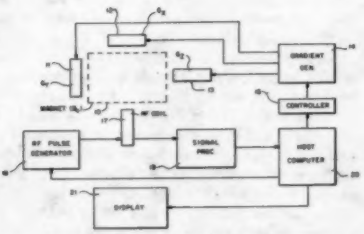
MAGNETIC RESONANCE IMAGING METHOD

Elias Zerhouni, Baltimore, Md., and David M. Parish, Palo Alto, Calif., assignors to Resonex, Inc., Sunnyvale, Calif. and Johns Hopkins University, Baltimore, Mass.

Filed Mar. 4, 1988, Ser. No. 164,263

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 A **9 Claims**



1. A magnetic resonance imaging (MRI) method to track the motion of tissue where an image is produced by application of

a radio frequency (RF) pulse sequence to a tissue specimen which produces signals utilized for forming said image, the method comprising the following steps:

at least partially saturating protons in at least one plane by applying a slice select gradient and at least one RF pulse to impose a grid system in the tissue specimen each of said, at least one saturated plane forming a saturated line of said grid system, the saturation causing said grid system to produce substantially no said signals during a subsequent imaging step;

delaying a variable period of time less than the T1 relaxation time of said tissue specimen to allow the tissue specimen of interest to move; following said delay producing an image of the tissue specimen, said image being taken perpendicular to said at least one said saturated plane whereby motion of the tissue specimen between the saturation and imaging steps is reflected in distortion and/or translation of said saturated line as seen in the image.

4,953,555

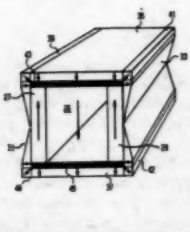
PERMANENT MAGNET STRUCTURE FOR A NUCLEAR MAGNETIC RESONANCE IMAGER FOR MEDICAL DIAGNOSTICS

Herbert A. Leupold, Eatontown, and Ernest Potenziani, II, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 112,192, Oct. 20, 1987, abandoned. This application Oct. 12, 1989, Ser. No. 420,745

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653 A **5 Claims**



1. A magnetic device for nuclear magnetic resonance diagnostics comprising, in combination:

a longitudinally extending magnet element comprising a pair of flux carrying magnets made of a compound containing one or more rare earth elements, said pair of magnets aligned parallel to and separated from each other a given distance, and a pair of pole pieces aligned parallel to each other and bridging the edges of said pair of flux carrying magnets, said pair of magnets and said pair of pole pieces forming a diagnostic workspace conforming generally to the size and shape of the human body, a magnetic field being generated by said magnet element, said magnetic field extending transversely through said workspace;

cladding magnet means for confining said magnetic field in said workspace, said cladding magnet means coextending longitudinally with said longitudinally extending magnet element, disposed and arranged in lateral relation thereto and having a magnetization substantially normal to the magnetic field of said longitudinally extending magnet element thereby confining said magnetic field in said workspace;

bucking magnets arranged and mounted, coextensive with each pole piece, each bucking magnet having a magnetization directed parallel to the magnetic field produced by the longitudinally extending magnet element.

4,953,556

METHOD AND APPARATUS FOR THE MEASUREMENT OF THORACIC FIELD POTENTIOMETRY

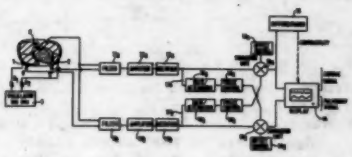
John M. Evans, Bell Cottage, Oaksmere, Appleton, Abingdon, Oxfordshire, OX13 5JS, United Kingdom

Filed Feb. 29, 1988, Ser. No. 162,256

Claims priority, application United Kingdom, Dec. 13, 1984, 8431500

Int. Cl.[5] A61B *5/205*

U.S. Cl. 128—671 **17 Claims**



1. A method of measuring cardiac activity, which method comprises

generating an oscillating electrical signal,

applying the oscillating electrical signal to the the thorax of a patient,

providing in the oesophagus of the patient an oesophageal probe including a first electrode,

providing a second electrode on the left side of the chest of the patient in a position such that measurement of voltage between the said first and second electrodes provides a measure of cardiac volume, and

measuring the voltage induced between the first and second electrodes and producing therefrom an output signal indicative of cardiac activity in the patient.

4,953,557

BLOOD PRESSURE MONITOR

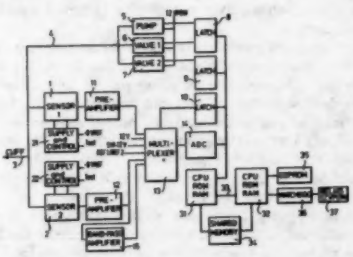
Michael Frankenreiter, Sindelfingen; Rainer Rometsch, Wildberg, and Jens-Peter Seher, Stuttgart, all of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 1, 1989, Ser. No. 345,927

Claims priority, application European Pat. Off., May 14, 1988, 88107800.0

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—677 **26 Claims**



1. Apparatus for automated measurement of blood pressure by application of air pressure to a cuff in such a manner as to prevent a harmful pressure from occurring in said cuff comprising

air control means including a pump for inflating or deflating a cuff via an outlet,

first and second pressure sensors adapted to be coupled to a cuff so as to respectively provide first and second signals indicative of the pressure in the cuff,

means having stored calibration data for each of said pressure sensors,

electronic means for activating said pump, for determining from said first and second signals and said calibration data the calibrated values of pressure for each of said sensors and for causing said air control means to deflate a cuff if either of said calibrated values exceeds a predetermined amount, and

said electronic means having means for comparing said calibrated pressure values and for causing said air control means to deflate a cuff when they differ by more than a predetermined amount.

4,953,558

TISSUE SAMPLING DEVICE

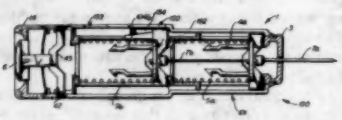
Dan Akerfeldt, Uppsala, Sweden, assignor to C. R. Bard, Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 270,368, Nov. 14, 1988. This application Feb. 16, 1990, Ser. No. 481,444

Claims priority, application Sweden, Nov. 19, 1987, 8704559

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—751 **3 Claims**



1. A tissue sampling device comprising:

a guide sleeve having front and rear guide sleeve ends and defining a longitudinal axis extending between said front and rear guide sleeve ends;

a hollow first needle positioned within said guide sleeve and extendable from said front guide sleeve end, said hollow first needle being moveable along said axis;

a second needle extending through said hollow first needle and movable along said axis, said second needle having a tip which is extendable from said hollow first needle and said front guide sleeve end, and said second needle having a tissue sample receiving recess located adjacent said tip;

a first needle holder coupled to said hollow first needle and mounted within said guide sleeve for movement along said longitudinal axis to move said hollow first needle along said axis;

a second needle holder coupled to said second needle and mounted within said guide sleeve for movement along said longitudinal axis to move said second needle along said axis;

a first spring disposed within said guide sleeve and operatively associated with said second needle holder, said first spring being capable of being placed into an energized mode to store energy, and said first spring being releasable from said energized mode to propel said second needle holder along said axis towards said front guide sleeve end, such that said tip of said second needle is extended from said hollow first needle, whereby a tissue sample can be captured within said recess;

a second spring positioned within said guide sleeve and operatively associated with said first needle holder, said second spring being capable of being placed into an energized mode to store energy, and said second spring being releasable from said energized mode to propel said first needle holder along said axis towards said front guide sleeve end, said hollow first needle being extended from said front guide sleeve end such that said recess of said second needle is enclosed by said hollow first needle;

a first latch means selectively releasable from outside said guide sleeve for releasably holding said first spring in said energized mode;

a second latch means for releasably holding said second spring in said energized mode, said second latch means being releasable in response to and subsequent to release of said first spring;

a tensioning sleeve rotatably mounted on said guide sleeve and operative upon rotation thereof to move said first needle holder and second needle holder along said axis towards said rear guide sleeve end to cause said first latch means to hold said first spring in said energized mode and to cause said second latch means to hold said second spring in said energized mode; and

indicator means operatively associated with one of said first and second needle holders and visible from without said tensioning sleeve for indicating the energized status of said first and second springs;

whereby a user can visually confirm by viewing said indicator means whether said springs are in said energized modes.

4,953,559

CATHETER FOR ENDOCARDIAL BIOPSY, WHICH CAN ALSO BE USED FOR IDENTIFYING THE POINT OF ORIGIN OF VENTRICULAR ARRHYTHMIA

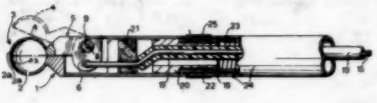
Jorge A. Salerno, Pavia, Italy, assignor to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Nov. 14, 1988, Ser. No. 270,587

Claims priority, application Italy, Nov. 16, 1987, 67978 A/87

Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—751 **4 Claims**



1. A catheter for cardial biopsy, including distal and proximal end portions, biopsy forceps provided at the distal end and including two jaws which are movable relative to each other between an open position and a closed position, and means which are operable from the proximal end of the catheter for moving the jaws, wherein at least two electrodes are provided in correspondence with the distal portion, said electrodes being constituted by the two jaws of the forceps, with said jaws being made from electrically conductive material and being electrically insulated from each other in their open position, wherein two terminals are situated at the proximal end of the catheter and are connected electrically to the electrodes so that the catheter can be used for identifying the point of origin of a ventricular arrhythmia, wherein the distal end of the catheter has a supporting body which incorporates one jaw of the forceps, and wherein the catheter also includes a lever which forms the other jaw and a pin of insulating material by means of which the lever is articulated to the supporting body, and wherein the catheter includes a helical metal spiral which runs along the whole length of the catheter, one end of the spiral being connected to the supporting body and an opposite end of the spiral being connected to one of the terminals.

4,953,560

APPARATUS, METHOD, AND TEST KIT FOR DIAGNOSIS OF VAGINAL YEAST INFECTIONS

Bernard Samuels, 5624 Evelyn Ct., New Orleans, La. 70124

Filed Dec. 7, 1989, Ser. No. 447,466

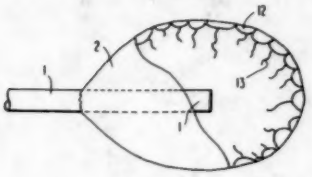
Int. Cl.[5] A61B *10/00*

U.S. Cl. 128—759 **20 Claims**

1. A diagnosis device for vaginal yeast infections comprising:

a support stick;

a swab having loosely woven fibers attached to one end of said support stick; and



a growth media for culturing and diagnosing vaginal yeast infection infiltrated between said loosely woven fibers of said swab.

4,953,561

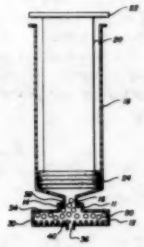
URINE TESTING MODULE AND METHOD OF COLLECTING URINE ANTIGEN

Raouf A. Guirguis, Rockville, Md., assignor to Cancer Diagnostics, Inc., Rockville, Md.

Continuation-in-part of Ser. No. 408,547, Sep. 18, 1989. This application Sep. 22, 1989, Ser. No. 411,041

Int. Cl.[5] A61M *5/165*

U.S. Cl. 128—771 **18 Claims**



1. An apparatus for testing molecular specimens in a biological fluid comprising a syringe, a specimen treatment unit mounted to said syringe, said specimen treatment unit comprising means comprising a housing with an inlet and outlet means, a filter means mounted to said housing which allows fluid flow and antigens carried by said biological fluid to flow there through, a primary antibody bead means contained in said housing on the syringe side of said filter means which is adapted to capture designated antigens carried by said fluid.

4,953,562

METHOD OF URINE SPECIMEN IDENTIFICATION

Fred Rosen, 8069 Caminito Mallorca, La Jolla, Calif. 92307, and Bernard Rimland, 4182 Adams Ave., San Diego, Calif. 92116

Filed Nov. 4, 1988, Ser. No. 267,197

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—771 **7 Claims**

1. A method for identifying the source of a urine sample to be collected for biological or chemical analysis which comprises;

a. administering to a person or animal whose urine is to be tested a formulation containing predetermined portions of one or more identifying substances selected from the group consisting of thiamine, riboflavin, niacinamide, pyridoxine, and mixtures thereof;

b. maintaining an identification of said formulation so that said person or animal to which it was administered and a urine collecting means for said person or animal can be identified;

c. obtaining a urine sample from said person or animal in said urine collecting means;

d. analyzing said urine sample for the presence of said identifying substances or their metabolites.

4,953,563

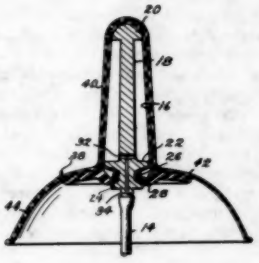
PROTECTIVE DISPOSABLE SHEATH FOR MUSCLE MONITOR

Howard Kaiser, and Laurie A. C. Kaiser, both of 75-04 249 St., Bellerose, N.Y. 11426

Filed Jun. 20, 1986, Ser. No. 876,484

Int. Cl.[5] A61B *5/22*

U.S. Cl. 128—778 **4 Claims**



1. A generally funnel-shaped protective disposable sheath for use with a muscle monitor of the kind including a compressible-expansible elongated blub insertable into a body cavity and a generally annular flange of greater diameter than the bulb adjacent one end of the bulb for limiting the extent of penetration of the bulb into the body cavity, said sheath being made of flexible elastomeric material and including a posterior end portion and an anterior end portion adapted to fit over the bulb, said anterior portion being of elongated tubular configuration having a closed free end, the opposite end of said anterior portion being open and merging in an axial direction into a generally cup-shaped posterior portion of enlarged diameter adapted to overlie that surface of a muscle monitor flange which faces the bulb of the monitor, said cup-shaped posterior portion diverging outwardly along essentially its entire length and terminating in a skirt having an open end of maximum diameter.

4,953,564

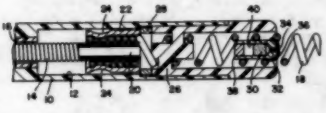
SCREW-IN DRUG ELUTING LEAD

Wendy A.W. Berthelsen, Range, Mich., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 23, 1989, Ser. No. 398,199

Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—784 **9 Claims**



1. An electrical medical lead comprising:

an elongated insulative lead body having a proximal end and a distal end;

an elongated conductor, mounted within said lead body, said conductor having a proximal end and a distal end;

an electrode assembly mounted at the distal end of said insu-

lative lead body, said electrode assembly comprising an electrode head member having a lumen open to the distal end of said lead body; a fixation helix mounted within said lumen of said head member, said fixation helix having a proximal end and a distal end, said fixation helix mounted in said lumen of said head member such that said helix is advanceable from a first, retracted position within said lumen of said head member in which the distal end of said helix is adjacent the distal end of said lead body to a second, advanced position in which the distal end of said fixation helix projects distally of the distal end of said lead body, said electrode assembly further comprising a drug release device having a proximal end and distal end and having means for releasing a drug contained within said drug release device at least adjacent the dital end of said drug release device, said drug release device mounted to said fixation helix such that when said fixation helix is in said first, retracted position within aid lumen of said head member, the distal end of said drug release device is located within the lumen of said electrode head member and such that when said helix is advanced to said second, extended position, the distal end of said drug release device is adjacent the distal end of said lead body, the distal end of said helix extending distally of the distal end of said drug release device, said electrode assembly further comprising at least one conductive electrode surface coupled to the distal end of said elongated conductor; and

means for advancing said fixation helix from said first, retracted position to said second, extended position.

4,953,565

ENDERMIC APPLICATION KITS FOR EXTERNAL MEDICINES

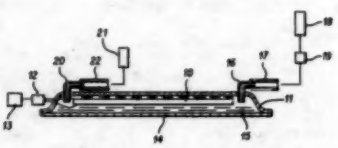
Shunro Tachibana, 1-6-18, Kusagae, Chuo-ku, Fukuoka-shi, Fukuoka-ken, and Uichi Shibata, Tokyo, both of Japan, assignors to Shunro Tachibana, Fukuoka and Meiji Seika Kaisha, Ltd., Tokyo, both of, Japan

Continuation-in-part of Ser. No. 120,555, Nov. 13, 1987, Pat. No. 4,821,740. This application Mar. 28, 1989, Ser. No. 329,913

Claims priority, application Japan, Nov. 26, 1986, 61-282703

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—798 **4 Claims**



1. An endermic application kit for external medicines, comprising:

a container for retaining liquid containing drug, said container having a bottom opening, an inlet for the liquid, and an outlet for the liquid,

means for supplying the liquid containing drug into the container,

a drug permeable layer attached to the container to cover the bottom opening of the container, and

an ultrasonic oscillator situated inside the container so that when the ultrasonic oscillator and supplying means are actuated, the liquid containing drug is continuously supplied to the container and the drug contained in the liquid is applied to a skin of a patient through the drug permeable layer by means of the ultrasor.ic oscillator.

4,953,566

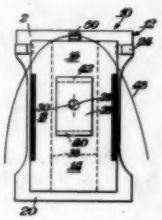
BODY WRAP FOR USE IN DIAGNOSTIC PROCEDURE

Lloyd R. Garren, P.O. Box 3738, Wilmington, Del. 19807

Filed May 18, 1989, Ser. No. 337,939

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—849 **3 Claims**



1. A disposable body wrap configured to be worn by a person in the manner of a diaper, the body wrap comprising a sheet having front and back area portions interconnected by a crotch area portion, each of the front and back area portions having a waistband portion and means for releasably securing these waistband portions together around the waist of a person wearing the body wrap, a small access opening in the form of a slit in the crotch area portion of the sheet positioned and dimensioned to permit instrumentation to pass therethrough for rectal examination of a person wearing the body wrap, and a flap on the outside of the sheet covering the small access opening in the crotch area portion, the flap having first and second pairs of opposite edges fixedly secured to the outside of the sheet and also having a small access opening in the form of a slit offset and parallel to the slit in the sheet positioned and dimensioned to permit instrumentation to pass therethrough for rectal examination purposes.

4,953,567

PROPHYLACTIC DEVICE FOR USE WITH A TELEPHONE

Dale Ward, 3848 Charlotte Rd., Rex, Ga. 30273

Filed Dec. 5, 1988, Ser. No. 279,944

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—851 **8 Claims**

1. A prophylactic device for protection from exposure to germs contained on a telephone receiver and dial pad comprising:

(a) a sleeve having an open end, a closed end and a continuous wall connecting said open end and said closed end, said wall having interior and exterior sides, said sleeve being of appropriate length and width to envelop a telephone receiver;

(b) a manipulator member having a front side and a back side, said manipulator member being detachably secured

to and extending from the said sleeve at said open end where said front side is continually connected to said interior wall of said sleeve and said back side is continuously connected to the exterior wall of said sleeve, said manipulator member extending partially around the diameter of said open end of said sleeve and being of a size to protect a user's hand while grasping a telephone receiver.

4,953,568

ADJUSTABLE THUMB BRACE

Charles W. Theisler, 1749 S. Raccoon Rd., Austintown, Ohio 44515

Filed Mar. 1, 1990, Ser. No. 486,871
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—878 **4 Claims**

1. An adjustable thumb restraint for engagement on a person's hand, comprises a resilient annular band member, said band member having spaced parallel upper and lower edge portions, a thumb retaining sleeve secured to said annular band member, aid sleeve extending both above and below said parallel edges of said annular band, an elongated adjustable tab extending from said sleeve, fastening means secured in oppositely disposed relation on said elongated tab inwardly from its free end, a secondary elongated adjustable tab secured to said annular band in spaced relation to said thumb receiving sleeve, fastening means secured said secondary elongated tab and said annular band for registration therewith.

4,953,569

JOINT PROTECTOR PAD

Robert Lonardo, Treasure Island, Fla., assignor to L'nard Associates, Inc., St. Petersburg, Fla.

Filed May 17, 1988, Ser. No. 194,930
Int. Cl.[5] A61F *13/00*
U.S. Cl. 128—892 **1 Claim**

1. A pad for preventing skin abrasions at the joints of persons having impaired mobility, comprising,

a substantially round pad means having a concave shape and inner and outer sides, a peripheral edge, and a central portion,

said outer side of said pad means being comprised of a wear-resistant material,

the inner side of said pad means being comprised of a first pad element extending over substantially all of the wear-resistant material and being permanently secured to said wear-resistant material so as to prevent relative movement therebetween, said first pad element having the texture of wool fleece, and having a central portion,

a second pad element permanently secured to the central portion of said first pad element to prevent relative movement therebetween and so as to be in covering relation to the central portion,

strap means on said pad means for securing the pad means to the person,

fastening means on said strap means adapted to be secured together to secure said pad means to the joint of a person wearing the pad means,

said second pad element and said strap portions being comprised of foam rubber of modular open cell construction,

said strap means being secured to at least the peripheral edge of said pad means,

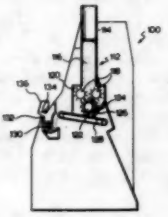
and at least one ventilation hole in said were-resistant material and said second pad element.

4,953,570

CIGARETTE MAKING MACHINE HOPPER

Warren A. Brackmann; Stanislav M. Snaidr, both of Mississauga; Takeshi Nehyo, Willowdale, and Michael H. Sheahan, Toronto, all of Canada, assignors to Rothmans, Benson & Hedges Inc. and Rothmans International Services Limited, both of Toronto, Canada

Division of Ser. No. 190,122, May 4, 1988, Pat. No. 4,867,180.
This application May 26, 1989, Ser. No. 357,300
Int. Cl.[5] A24C *5/39*
U.S. Cl. 131—109.1 **7 Claims**



1. A method of forming a tobacco filler rod suitable for the formation of cigarettes, which comprises:

providing a source of cut tobacco located in an upright reservoir zone of generally rectangular cross-section having a tobacco receiving upper inlet and a lower outlet,

metering cut tobacco from said lower outlet of said reservoir zone by a cooperating pair of counterrotating rollers having pins extending from the surfaces thereof so as to meter tobacco from the outlet,

opening said metered cut tobacco to separate the individual tobacco particles one from another by a third roller having pins extending from the surface thereof, so as to interact with the pins of the cooperating pair of rollers to open tobacco metered by the cooperating pair of rollers,

forming a wide stream of tobacco particles from all the individual separated tobacco particles directly on the external surface of a rectilinear tobacco-conveying device,

transporting said wide stream of tobacco particles on said

tobacco-conveying device to a location of formation of a vertically-moving shower,

forming a vertically-moving shower of cut tobacco particles from said transported wide stream of tobacco particles while maintaining said tobacco particles in their individual separated condition, and

forming said filler rod directly from said vertically-moving shower.

4,953,571

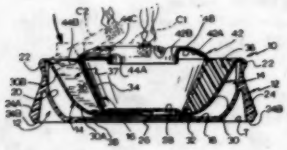
ASH TRAYS

Raymond Tremblay, Montreal, Canada, assignor to Les Entrepôts Dupont et Lanctot Inc., St. Constant, Canada

Filed May 30, 1989, Ser. No. 358,409

Int. Cl.[5] A24F *19/02, 19/14*

U.S. Cl. 131—231 **6 Claims**



1. An ash tray comprising a bowl and a bottomless cup fitted within said bowl; said bowl defining an upwardly-outwardly-diverging side wall having an upper edge section and a bottom wall, said cup defining an upwardly-outwardly extending side wall having a top edge and a bottom edge resting on the bowl bottom wall, a plurality of winglets radially, outwardly projecting from said cup side wall, the radially-outward edge of said winglets conforming to the shape of said bowl and snugly fitting therewithin, whereby a plurality of small compartments are defined between the bowl and the cup side walls and between each pair of successive winglets; a cigarette being engageable in any selected one of said compartments, for extinguishing the same; said cup further including a ring-like member, radially, inwardly extending from the top edge thereof and defining cigarette supporting means; further including an outer shell having a side wall and a bottom wall and into which is fitted said bowl; said bowl bottom wall being upturned; the upper edge portion of said bowl side wall supported by said shell side wall, whereby the bowl bottom wall is spaced from said shell bottom wall; the latter having a central bore, whereby ventilation is facilitated between the outer shell and the bowl.

4,953,572

METHOD AND APPARATUS FOR AIDING IN THE REDUCTION OF INCIDENCE OF TOBACCO SMOKING

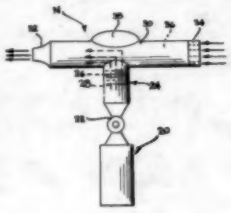
Jed E. Rose, 907 Kimball Dr., Durham, N.C. 27705; Murray E. Jarvik, 2001 Georgina Avenue, Santa Monica, Calif. 90402, and Karce D. Rose, 4050 W. Soda Rock Dr., Healdsburg, Calif. 95448

Division of Ser. No. 727,525, Apr. 25, 1985. This application Feb. 19, 1988, Ser. No. 157,948

Int. Cl.[5] A24F *47/00*

U.S. Cl. 131—270 **21 Claims**

1. A low concentration nicotine aerosol spray for inhalation to aid in smoking incidence reduction, said aerosol spray having droplets within the size range of between about 1 micron to about 10 microns in diameter and with the droplet size selected to stimulate either the upper respiratory tract or the lower respiratory tract or both, and which spray contains nicotine which renders an amount of about 0.005 mg to about 0.03 mg per inhalation rendering a nicotine concentration substantially less than that obtained from a puff of cigarette smoke and which does not produce any significant level of nicotine still provides the throat and respiratory tract stimuli obtained from



tobacco smoke and which also eliminates the harmful effects of nicotine in larger concentrations.

4,953,573

ROD MONITORING DEVICE

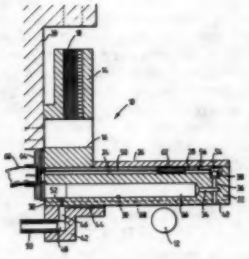
Michael J. Cahill, and John Dawson, both of Coventry, England, assignors to Molins plc, Milton Keynes, England

Filed Jun. 23, 1989, Ser. No. 369,756

Claims priority, application United Kingdom, Jun. 23, 1988, 8814929

Int. Cl.[5] A24C *5/32*

U.S. Cl. 131—280 **14 Claims**



11. A monitoring device, particularly for detecting imperfect longitudinal seams in the wrapper of a cigarette or cigarette filter rod, comprising a fixed surface which may be located adjacent to an axial path of the rod, means for directing an air stream along said surface in a direction generally transverse to said path, and means for monitoring sound caused by said stream after it has passed adjacent said path, whereby disturbance of said stream caused by defects in a rod on said path may be detected by said monitoring means, said sound monitoring means comprising a microphone located to receive sound through a passage having an opening in said surface, and further including means for establishing an air flow in said passage to eliminate or reduce contamination.

4,953,574

HAIR CURLER WITH A CLAMPING MEMBER

Eiji Tsuji, Hikone, and Hideharu Nakano, Oomihachiman, both of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Continuation of Ser. No. 4,739, Jan. 20, 1987, abandoned. This application May 24, 1989, Ser. No. 357,649

Claims priority, application Japan, Jan. 20, 1986, 61-9295

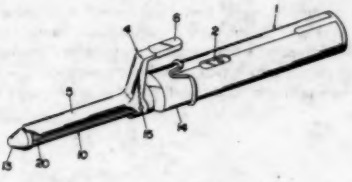
Int. Cl.[5] A45D *1/04*

U.S. Cl. 132—232 **2 Claims**

1. A hair curler comprising a barrel provided with an electri-

cal resistance heating element extending along the exterior thereof and a hair clamping member adapted to clamp hair to the heating element on the barrel;

said hair clamping member comprising a clamping plate section adapted to be placed over one circumferential portion of the barrel in closely adjacent relation thereto; and said heating element comprising a plurality of resistor segments connected in a series-parallel combination across an electric source, extend lengthwise of the barrel and are



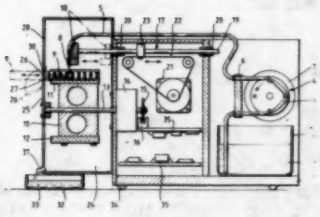
spaced circumferentially therearound, with said resistor segments on the portion of the barrel located away from the clamping plate section of said hair clamping member connected in parallel and said resistor segments mounted on the portion of the barrel located closely adjacent to said clamping plate section connected in series to produce a greater amount of heat at that section than the resistor segments connected in parallel on the portion of the barrel located away from the clamping plate section of said hair clamping member.

4,953,575

WASHING DEVICE

Jukka Tervamäki, Helsinki, Finland, assignor to Labsystems Oy, Helsinki, Finland

Filed Oct. 2, 1989, Ser. No. 415,636
Claims priority, application Finland, Sep. 30, 1988, 884502
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—57 R **10 Claims**



1. A washing device for washing cuvette sets comprising:

a frame (1)

a tube pump (4) supported within said frame having cooperatively associated therewith a vessel (2) for containing washing liquid (3) therein,

at least one hose (5) cooperatively associated with said tube pump, said hose (5) communicating with said vessel (2) and extending thr ugh said tube pump and to a cuvette holding means located downstream of said tube pump (4) whereby said tube pump (4) causes washing liquid (3) to flow from said vessel (2), through said pump and to said cuvette holding means via a dosage transfer device (17) to which an end of said hose (5) is connected,

a compartment located downstream of said tube pump (4) with said dosage transfer device (17) slidably mounted therein,

a stepping motor (21) mounted within said compartment and drivingly coupled to said dosage transfer device,

said dosage transfer device (17) being mounted to move backward and forward via said stepping motor,

a chamber (24) fixed to a joining wall of said compartment into which said dosage transfer device (17) extends,

a rotor assembly (10) mounted on a shaft (13) rotatably supported in said chamber, said shaft extending into said compartment and coupled to a motor (14) mounted in said compartment,

and said cuvette holding means (11) disposed on a surface of said rotor assembly (10) for detachably mounting a cuvette set thereto to be washed,

said dosage transfer device having means at its end for supporting at least one hose (5) extending into said chamber (24) from said tube pump,

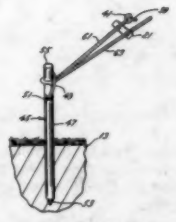
whereby cuvette sets are washed by feeding washing liquid (3) via said tube pump (4) to said at least one hose (5) connected at its end to said transfer device (17) by depositing washing fluid (3) into said cuvettes and the washing fluid thereafter removed by centrifugal force by rotating said rotor confined in said chamber (24).

4,953,576

METHOD AND APPARATUS FOR STAKING ARTICLES TO A GROUND SURFACE

Thomas R. Connelly, 423 Pratt St., Niles, Ohio 44406

Filed May 2, 1989, Ser. No. 345,991
Int. Cl.[5] E04H *15/62*
U.S. Cl. 135—118 **3 Claims**



1. A method of securing an article, having a rope extending therefrom, using an elongated stake having a sharp first end of a body portion for driving into a ground surface, a blunt second end, of said body portion for transferring a driving force to said body portion and a ring-shaped outrigger secured to said body portion proximate said second end and freely rotatable about a horizontal axis, said method comprising the steps of:

looping a free end of said rope;

drawing the loop formed by said free end of said rope through said ring-shaped outrigger;

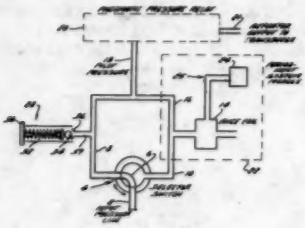
passing the eye of said loop over said blunt second end of said body portion; and

drawing said rope taut between said stake and said article, thereby rotating said ring-shaped outrigger upwardly about said horizontal axis and into a baised engagement with said body portion of said stake.

4,953,577
SPRAY ENCAPSULATION OF PHOTOVOLTAIC MODULES
Jack Marshall, Glenolden, Pa., assignor to Solarex Corporation, Rockville, Md.
Filed Jul. 6, 1989, Ser. No. 375,954
Int. Cl.[5] H01L 31/048
U.S. Cl. 136—251 14 Claims

10. An encapsulated photovoltaic module comprising:
a superstrate and one or more photovoltaic cells having an exposed surface disposed on said superstrate; and
a barrier coating applied to said exposed surface of the one or more photovoltaic cells, said barrier coating comprising the reaction product of a mixture comprising a two component fluorinated polyurethane and 3-glycidoxypropyltrimethoxy silane.

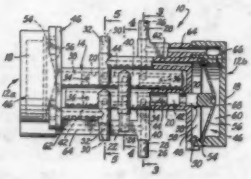
4,953,578
DUAL MODE PNEUMATIC CONTROL SYSTEM
Thomas O. Kautz, Mequon, Wis., assignor to Johnson Service Company, Milwaukee, Wis.
Filed Nov. 2, 1989, Ser. No. 430,716
Int. Cl.[5] G05D 16/00
U.S. Cl. 137—14 17 Claims



15. A method for operating an HVAC system, comprising the steps of:
providing pneumatic fluid to the system;
selecting the mode of operation of the system;
diverting the pneumatic fluid to a pathway corresponding to the mode selected;
regulating the pressure of the diverted pneumatic fluid;
supplying the pneumatic fluid to a pressure relay; and
providing from the pressure relay an output of pneumatic fluid for operating the components of the HVAC system.

4,953,579
QUICK ACTING DIVERSION VALVES
Robert E. Phillips, 12217 Iredell St., Studio City, Calif. 91601, and Ben A. Otsap, 7661 Airport Blvd., Los Angeles, Calif. 90045
Filed Feb. 20, 1987, Ser. No. 17,321
Int. Cl.[5] G05D 7/01
U.S. Cl. 137—106 7 Claims

1. A valve including a housing, said housing having an internal cavity, an inlet and two outlet ports located in said housing so as to lead into the interior of said cavity, said valve also including a valve body located within said cavity, said valve body being capable of being moved between a first position in which it places said inlet port in communication with one of said outlet ports and a second position in which it closes off the one of said outlet ports, said valve also including actuating means for moving said valve body between said first and second positions, said actuating means being connected to said valve body in which the improvement comprises:
said cavity is an elongated bore within said housing,
said valve body is a valve spool which is capable of being moved along the length of said bore in being shifted between said first and second positions,
said actuating means including wall means defining a hollow cavity, a diaphragm means having two positions of stability locate within said cavity and having its periphery held by said wall means so as to divide said cavity into two compartments, a first control port leading through said wall means into a first of said compartments, a second control port leading through said wall means into a second

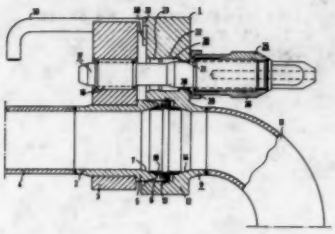


of said compartments, and mechanical means connecting the center of said diaphragm means to said valve body,
said diaphragm means, said mechanical means and said valve body being physically related so that in a first stable position of said diaphragm means said valve body is in said first position and in the second stable position of said diaphragm means said valve body is in said second position,
said diaphragm means being responsive to the fluid pressure differential between said compartments so as to be oriented in either of said positions of said diaphragm means in accordance with such differential,
the center of said diaphragm means is aligned with said bore in both of said positions and in moving between said positions, and
said mechanical means is a rigid member extending in alignment with said bore.

4,953,580
BOLTED PIPE JOINT RELEASABLE BY REMOTE CONTROL AND COMBINATION TOOL THEREFOR
Hans-Peter Schabert, Erlangen; Erich Strickroth, Buckenhof, and Erwin Laurer, Moehrendorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Hanover and Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Munich, both of, Fed. Rep. of Germany
Filed Jul. 15, 1988, Ser. No. 219,979
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723386
Int. Cl.[5] F16L 55/00
U.S. Cl. 285—23 29 Claims

1. Bolted pipe joint releasable by remote control, comprising a fixed flange and a releasable flange each being disposed at a respective one of two pipe end, a centering aid cooperating with both of said flanges, a seal, and a fastening screw being retained by said releasable flange in a disengaged position and pressing said two flanges together in an engaged position, said

fastening screw having first and second threaded regions being successively engaged upon pressing said flanges together, said



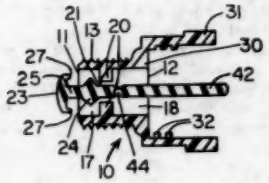
first threaded a region having a substantially greater pitch than said second threaded region.

4,953,581

SELF DRAINING VALVE MEMBER FOR USE IN UNDERGROUND WATER LINES

Don Patterson, 4298 Shirley La., Salt Lake City, Utah 84121

Filed Aug. 14, 1989, Ser. No. 393,231
Int. Cl.[5] F16K *15/14*
U.S. Cl. 137—107 **11 Claims**



1. A self draining valve member for use with a water line of an underground water distribution system, said valve member comprising

a first conduit having first and second ends and a cylindrical outer surface

screw threads formed on at least a portion of said outer surface which is adjacent to the first end of said conduit, wherein said screw threads are adapted to engage a threaded fitting on the water line such that said first end of said conduit is in fluid flow communication with said water line;

a first bore extending axially inward from the first end of said conduit;

a second bore extending axially inward from the second end of said conduit;

a transverse wall positioned across an intermediate section of the conduit to separate the first and second bores, with opposite first and second sides of said transverse wall being substantially flat and forming the innermost ends of the first and second bores, respectively;

a drain bore extending through the transverse wall to establish flow communication between said first and second bores, with said drain bore having a reduced passage relative to either of the first and second bores;

a first valve seat formed by the substantially flat first side of said transverse wall circumscribing said drain bore at the inner end of said first bore;

a second valve seat formed by the substantially flat, second side of said transverse wall circumscribing said drain bore at the inner end of said second bore;

a first, resilient valve head in said first bore, said valve head having a face which seats on said first valve seat;

a second resilient valve head in said second bore to seat on said second valve seat;

a valve stem extending through said drain bore and connecting said first and second valve heads, wherein said valve stem has a length somewhat greater than the distance along the drain bore between said first and second sides of said transverse wall,

whereby said first valve head responds to a minimum water pressure in said water line to seat against said first valve seat to inhibit flow of water from said conduit through said drain bore and allows water in said water line to drain through said drain bore when there is less than the minimum water pressure in the water line, with said second valve head being capable of seating against said second valve seat in response to pressure of ground water to inhibit backflow of ground water into the water line,

with said valve member further comprising

a flange projecting circumferentially from said second end of said conduit;

a hollow cylindrical hood extending from said flange away from said conduit;

internal screw threads formed on at least a portion of the internal surface of said hood which is adjacent to said flange;

a threaded plug which engages said internal threads from the open end of said hood such that one end of said threaded plug can be screwed tightly against said second end of said conduit, with the other end of said threaded plug facing away from said conduit;

an opening through said threaded plug which establishes flow communication between said second end of said conduit and said hollow, cylindrical hood; and

a porous filter element sealed between said second end of said conduit and said threaded plug when said threaded plug is screwed against said second end of said conduit,

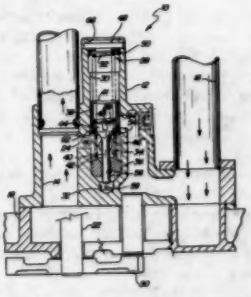
whereby said threaded plug and said porous filter element form a closed end of said second bore in said conduit to prevent foreign, solid objects such as dirt and pebbles from infiltrating into said second bore.

4,953,582

COMBINED PRESSURE REGULATOR AND RELIEF VALVE HAVING A SINGLE BIASING MEANS

Lawrence C. Kennedy, Birmingham, Mich., assignor to Detroit Diesel Corporation, Detroit, Mich.

Filed Jul. 27, 1989, Ser. No. 385,400
Int. Cl.[5] G05D *16/00*
U.S. Cl. 137—115 **10 Claims**



1. A pressure regulation and relief valve assembly comprising;

a valve body including a bore;

a regulating valve comprising a hollow spool having first and second ends defining one diameter, a center portion having a reduced diameter with respect to said first and

second ends and including a relief chamber defined by the center section of said hollow spool;

a poppet relief valve having a stem portion, a fluted crown portion and a frustoconical portion interconnecting said crown portion and said stem portion, said poppet valve being disposed within said regulating valve and said regulating valve being disposed within said bore, said regulating valve being movable between closed and open positions in response to a predetermined gallery pressure, said relief valve being moveable between said closed and open positions in response to a predetermined relief pressure;

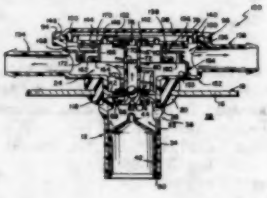
a single biasing means within said valve body for biasing said regulating valve and relief valve to closed positions said valves being located at the same end of said biasing means, said biasing means exerting a predetermined force to bias both of said valves toward said closed position and being responsive to both said predetermined gallery pressure and said predetermined relief pressure to allow said first regulating valve move to said open position and said relief valve to move to said second position.

4,953,583

TANK PRESSURE CONTROL VALVE

Emil Szlaga, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Mar. 24, 1989, Ser. No. 328,451
Int. Cl.[5] F16K *17/196*
U.S. Cl. 137—118 **30 Claims**



1. An apparatus for controlling discharge of fuel vapors from a fuel tank during refueling, the apparatus comprising

means for conducting fuel vapor between the fuel tank and a fuel vapor treatment site situated outside of the fuel tank,

means for selectively blocking flow of fuel vapor through the conducting means, the blocking means being operable between a flow-blocking position and a flow-delivery position,

means for yieldably biasing the blocking means toward its flow-blocking position, and

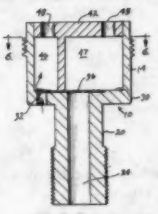
means defining a venting control chamber in communication with the blocking means for receiving and using fuel vapor pressure from the fuel tank having a magnitude in excess of a predetermined threshold level to exert an opening force on the blocking means in opposition to the biasing means so that the blocking means is moved to its flow-delivery position, thereby permitting discharge of pressurized fuel vapor in the tank to said fuel vapor treatment site through the conducting means, the blocking means being formed to include means for communicating fuel vapor from the fuel tank to the venting control chamber.

4,953,584

VACUUM BREAKER VALVE

Lajos Vegso, Culver, Ind., assignor to Bristol Corporation, South Bend, Ind.

Filed May 12, 1987, Ser. No. 48,810
Int. Cl.[5] F16K *24/00*; E03C *1/10*
U.S. Cl. 137—218 **6 Claims**



1. A valve for preventing backflow and siphoning, comprising a valve body having an air inlet port, a liquid inlet port and a liquid outlet opening,

an insert part including a plate member which extends into said valve body and constitutes means serving to divide the valve into first and second separate chambers, said first chamber having said air inlet port and being in communication with said liquid outlet opening, said second chamber having said liquid inlet port and being in communication with said liquid outlet opening,

a single piece diaphragm overlying both said inlet ports and being of such resiliency as to permit movement at each inlet port independently of the other in response to pressure conditions within each of said chambers,

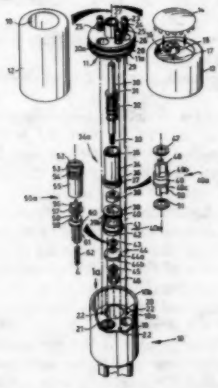
said plate member overlying contacting said diaphragm to anchor the diaphragm at said inlet ports.

4,953,585

TUB TRANSFER-DIVERTER VALVE WITH BUILT-IN VACUUM BREAKER AND BACK-FLOW PREVENTER

Pietro Rollini, Suno, Italy, and Domenic Luisi, Woodbridge, Canada, assignors to Rubinet Brass Canada Limited, Woodbridge, Canada

Filed May 19, 1989, Ser. No. 355,011
Claims priority, application Canada, Mar. 31, 1989, 595350
Int. Cl.[5] F16K *11/00, 24/02*
U.S. Cl. 137—218 **5 Claims**



1. A valve assembly comprising a main body housing having

at least one fluid inlet and at least two fluid outlets, flow paths associated with each of the inlets and outlets, and passages connecting the inlets and associated flow paths to the outlets and associated flow paths, one such passage being open to atmosphere; a diverter valve for transferring flow from one inlet to one or another of the outlets and comprising a hand actuated diverter rod connected to a bicone washer biased in a first position whereby fluid flows from an inlet to a first outlet and the second outlet is closed and sealed, and on actuating the diverter rod, the bicone washer is moved to a second position where it is maintained by pressure of fluid flow from the inlet to the second outlet and the first outlet is closed and sealed, and flow thereto ceases; a back-flow preventer/vacuum breaker valve located in the inlet flow path and a connecting passage, and movable, in response to changes in fluid flow direction or atmospheric pressure, from a first position, whereby back-flow is prevented as the valve closes and seals the inlet flow path, and opens the connecting passage outlet to atmosphere, to a second position in response to fluid flow from the inlet, whereby the connecting passage outlet to atmosphere is closed and sealed against fluid flow, the valve being normally located in the first position and returnable thereto with changes in fluid flow pressure and direction or atmospheric pressure; the valve having a truncated cone shape with an upper flange, guide means on each valve end and sealing means at each end to engage valve seats at the upper and lower limits of the path of travel of the valve; a back-flow preventer valve located in the first outlet flow path movable from a first position in which the valve is normally biased, whereby the inlet flow path is closed and sealed against flow, to a second position in response to fluid flow from the inlet path, the valve being of spindle-like shape with a whorl-like base having guide means and sealing means associated with it, and upper valve seat means to engage the valve sealing means.

4,953,586

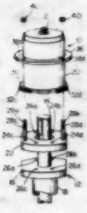
APPARATUS FOR ADJUSTMENT OF ROTARY VALVE ACTUATORS

Paul P. Weyer, 48811 286th Ave. SE, Enumclaw, Wash. 98022

Filed Jan. 16, 1990, Ser. No. 465,437

Int. Cl.[5] F16K *43/00, 31/16*

U.S. Cl. 137—315 **12 Claims**



1. In a system having a valve with open and closed positions, and a rotary valve actuator for controlling the opening and closing of the valve, apparatus for adjusting the fully open and fully closed positions of the valve comprising

a. a sub base having an upper surface and a lower surface, said sub base mounted to the valve, said sub base having threaded fasteners extending from the upper surface;

b. ring means fixedly attached to the actuator around the circumference of the actuator, said ring means having open portions for allowing passage of said threaded fasteners of said sub base therethrough;

c. a cover plate fitting around the actuator and resting on said ring means, said cover plate having holes to receive said threaded fasteners of said sub base;

d. fastening means compatible with said threaded fasteners for fastening said cover plate to said threaded fasteners of said sub base;

adjusting means within said ring means for rotating said ring means and the actuator relative to the sub base, said adjusting means is selected to abut against said fastening means causing said ring rotation thereby allowing fine adjustment of the fully open and fully closed positions of the valve.

4,953,587

BALL VALVES FOR PIPELINES

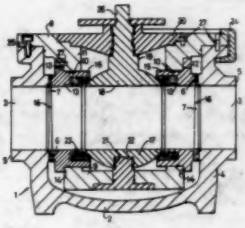
John Steele, Dunfermline, United Kingdom, assignor to T K Valve Limited, United Kingdom

PCT No. PCT/GB88/00660, § 371 Date Feb. 9, 1990, § 102(e) Date Feb. 9, 1990, PCT Pub. No. WO89/01583, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 10, 1988, Ser. No. 460,865

Int. Cl.[5] F16K *43/00, 5/06, 25/00*

U.S. Cl. 137—315 **2 Claims**



1. A ball valve comprising an outer housing (1) in the form of a substantially cylindrical pot open at one axial end and closed at the opposite axial end and having two diametrically opposing openings (3) in a wall (4) of the housing (1), the outer sides (5) of the openings (3) being adapted for connecting the housing (1) into a pipeline and flat annular seat faces (6) being formed around the openings (3) at the inner sides thereof, an annular wedge-shaped ring (7) located against each one of said seat faces (6) with the shallowest dimension of the ring (7) nearest the open end of the outer housing (1), an inner housing (8) having two opposing openings (10) in a wall (11) of the inner housing (8), with radial flat annular seats (12) being formed around the openings (10) at the outer sides thereof, two annular wedgeshaped shaped adaptors (13) each having a radial annular shoulder (14) located against the respective seats (12) on the inner housing (8), an inclined annular surface (16) on the outer side of each adaptor (13) with the deepest dimension of each adaptor (13) nearest the open end of the outer housing (1), a ball member (17) mounted for rotation within the inner housing (8), the ball member (17) having a diametrical through passage (18) and a rotatable operating stem (19) journalled in a removable closure bonnet (20), the inner housing (8), the adaptors (13), the ball member (17) and operating stem 19 being insertable into and withdrawable as a single subassembly from the outer housing (1) through its open end, and to reveal the ball member (17) and the seal adaptors (13) for inspection without having to removably detach the ball member (17) itself when the subassembly is withdrawn from the outer housing (1), the subassembly being insertable into the outer housing (1) to a fully assembled condition therewith where the inclined annular surface (16) of each adaptor (13) is wedgingly engaged with one of said annular wedge-shaped rings (7) for automatically causing a sealing engagement between the ball member (17) and the outer housing (1), and the ball member (17) is rotatable between an open position where its through passage (18) is aligned with the aligned openings in the outer housing (1) and the adaptors (13) and a closed position where the openings are blocked by the ball member (17), characterised in that the inner housing (8) is also in the form of a substantially cylindrical pot open at one axial end and closed at the opposite axial end, the two opposing openings (10) in the

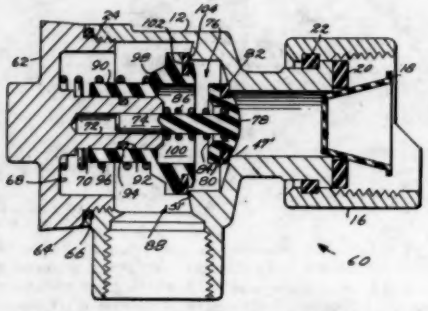
wall (11) of the inner housing (8) also diametrically opposing each other, the ball member (17) being rotatable about the axis of the inner housing (8) and being installable into the inner housing (8) through the open end thereof, and the removable bonnet (20) closing the inner housing (8) which in turn closes and is rigidly secured within and to the outer housing (1), and in that each adaptor (13) also has a cylindrical neck (15) projecting through the associated opening (10) in the inner housing (8), the neck (13) housing annular seal means (23) resiliently engaging the ball member (17).

4,953,588

DUAL CHECK VALVE

Robert E. Sands, Shelbyville, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Aug. 16, 1989, Ser. No. 394,647
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—512.3 **13 Claims**



1. A valve device comprising a housing having an inlet, an outlet and an interior passage connecting said inlet and outlet, said interior passage having first and second spaced apart valve seats each surrounding a common axis of said interior passage, a first valve means, means for mounting said first valve means for movement in said housing toward and away from said first valve seat and second valve means, said means for mounting including support means for said second valve means with said support means permitting movement of said second valve means toward and away from said second valve seat independently of said first valve means, first spring means urging said first valve means toward said first valve seat and having one end engaging a portion of said housing, second spring means urging said second valve means toward said second valve seat and having one end engaging said support means and an opposite end engaging said second valve means with said said second spring means being out of contact with said first valve means for all positions of said second valve means.

4,953,589

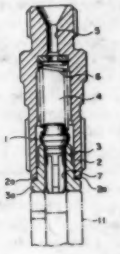
SEALING DEVICE OF DELIVERY VALVE FOR FUEL INJECTION UNITS

Hisashi Nakamura, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1990, Ser. No. 461,078
Claims priority, application Japan, Feb. 8, 1989, 1-13708[U]
Int. Cl.[5] F16K *15/06*
U.S. Cl. 137—543.23 **5 Claims**

1. In a sealing device of a delivery valve of a fuel oil injection unit for use in an internal combustion engine, said delivery valve including a valve body, a valve holder having a valve bore formed therein and accommodating said valve body, and an end portion defining therein an opening of said valve bore, a valve seat fitted into said opening of said end portion of said valve hOlder in an airtight manner, said valve seat having an axial through bore formed therethrough and slidably receiving said valve body, and a coiled spring received within said valve bore of said valve holder and urging said valve body toward said valve seat,

the improvement wherein said end portion of said valve holder has an end face thereof formed with an annular



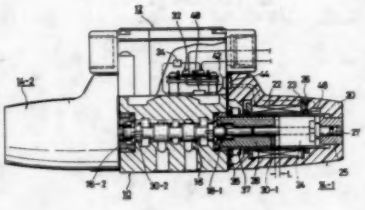
radially outer slant face moderately slanting with respect to an open end plane perpendicular to an axis of said valve holder, and an annular radially inner vertical face extending continuously from said annular radially outer slant face along a plane perpendicular to said open end plane.

4,953,590

ELECTROMAGNETIC DIRECTIONAL CONTROL VALVE

Toshifumi Kakinuma, Sano, and Kiyoshi Hayashi, Takebayashi, both of Japan, assignors to Tokyo Keiki Company Ltd., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,381
Claims priority, application Japan, Apr. 22, 1988, 63-99495; May 12, 1988, 63-115129; Jun. 17, 1988, 63-149293
Int. Cl.[5] F15B *13/044*
U.S. Cl. 137—554 **7 Claims**



1. An electromagnetic directional control valve which is switched and operated by applying a DC voltage, comprising:

a valve main body, which has a spool that is movable in an axial direction from a neutral position to at least one other predetermined position, for switching a passage;

electromagnetic driving means, having at least one movable core attached to one side of the spool provided in the valve main body and at least one coil in surrounding relation to said at least one movable core, for switching and moving the spool in the valve main body to a predetermined position by a DC electromagnetic force generated by a DC excitation of said at least one coil;

magnetism detecting means, comprising a board and a pair of magnetoresistive devices arranged on said board so as to perpendicularly cross in such a way that said magnetoresistive devices are electrically serially connected, for detecting an intensity of a DC magnetism which changes in accordance with the movement of said at least one movable core and for producing a detected magnetism output, by detecting the intensity of magnetism from a divided voltage which is determined by resistance values

of the magnetoresistive devices when a predetermined voltage is applied to a series circuit of said pair of magnetoresistive devices;

a detecting circuit for generating a detection output when said detected magnetism output of said magnetic detecting means exceeds a predetermined threshold value; and

display means for displaying that the valve main body has correctly operated on the basis of the detection output of said detecting circuit.

4,953,591

HYDRAULIC ACCUMULATOR

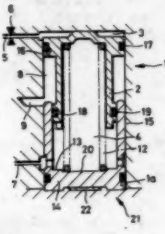
Kiyoharu Takagi, Okazaki; Naoya Tanikawa, Nagoya, and Minoru Ikeda, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 28, 1989, Ser. No. 398,974

Claims priority, application Japan, Aug. 31, 1988, 63-114513[U]

Int. Cl.[5] F16L *55/04*

U.S. Cl. 137—568 **5 Claims**



1. A hydraulic accumulator for a vehicle transmission comprising:

a valve body incorporated into a transmission casing and having a cylindrical interior space one end of which is open;

a piston slidably disposed in the interior space and dividing the space into first and second pressure chambers;

a cylindrical sleeve disposed in the interior space for closing the open end thereof, said cylindrical sleeve including a cover portion for closing the open end of the interior space and a cylindrical portion formed integral with the cover portion for slidable engagement with the piston; and

wherein the desired difference in effective areas of the piston in the first and second pressure chambers is variable in accordance with the thickness of the cylindrical portion of the sleeve.

4,953,592

SELF-SEALING COUPLING WITH BYPASS FOR HYDRAULIC CIRCUIT

Hiroyuki Takahashi, Tokyo, and Toshiaki Kurashima, Okayamaken, both of Japan, assignors to Sanyo Kiki Kabushiki Kaisha, Okayamaken and Yokohama Aeroquip, Tokyo, both of, Japan

Filed Aug. 7, 1989, Ser. No. 390,039

Claims priority, application Japan, Mar. 25, 1989, 1-34092[U]

Int. Cl.[5] F16L *37/28*

U.S. Cl. 137—599.1 **7 Claims**

1. A self-sealing coupling with a bypass for a hydraulic circuit, comprising:

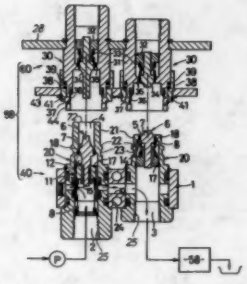
a coupling body, provided with an input passage and an output passage separate from each other;

self-closing valves, respectively provided in an outlet portion of said input passage and in an inlet portion of said output passage, each of said self-closing valves comprising a valve closing force exerting means for urging a valve element outwardly to close a valve port, said valve element being formed and disposed to be pushed back inwardly by an external force so as to open the valve port; and

a bypass valve adapted to open and close a bypass provided between said input passage and said output passage for connecting the same,

the coupling being characterized in that said bypass valve is provided with a cylindrical valve element which is reciprocatively slidable within one of said input passage and said output passage to open and close a communication hole provided between said one passage and said bypass,

said cylindrical valve element is movable with the self-closing valve element provided in said one passage, to be shifted to a bypass valve opening position where the communication hole is opened in a valve closed condition in which said one self-closing valve element is pushed outwardly by the valve closing force exerting means to close said one self-closing valve port and to be shifted to a bypass valve closing position, where the communication hole is closed, in a valve opened condition in which said one self-closing valve element is pushed back inwardly by an external force so as to open the one self-closing valve port, and



the valve opening and closing stroke of said one self-closing valve element and the cylindrical valve element is selected to be larger than a corresponding valve opening and closing stroke of the other self-closing valve element.

4,953,593

FLUID MIXING APPARATUS FOR PRODUCING VARIABLY CARBONATED WATER

William A. Edwards, P.O. Box 685, LaVernia, Tex. 78121, and Samuel Durham, 3539 Oakhorn, San Antonio, Tex. 78247

Filed May 31, 1989, Ser. No. 359,223

Int. Cl.[5] F16K *15/04, 47/08*

U.S. Cl. 137—606 **8 Claims**

1. An adjustable carbonator for producing carbonated water with a variable carbonation level, comprising:

a housing defining:

a mixing chamber for receiving streams of plain and carbonated water,

a first inlet passage for conveying plain water to said mixing chamber,

a second inlet passage for conveying carbonated water to said mixing chamber, and

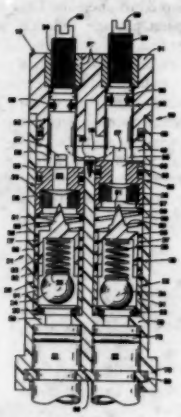
an outlet for conveying carbonated water from said mixing chamber; and

an inlet valve within at least one of said first and second inlet passages for adjustably controlling the flow therethrough, said inlet valve comprising:

a pressure responsive flow control washer having an orifice which maintains a relatively constant flow therethrough despite variations in flow pressure.

a needle valve for restricting the flow through the orifice of said flow control washer, and

a means for adjusting the proximal relationship between said washer and said needle valve to adjust the degree



to which said needle valve restricts the flow through the orifice of said washer.

4,953,594

FLOW CONTROL

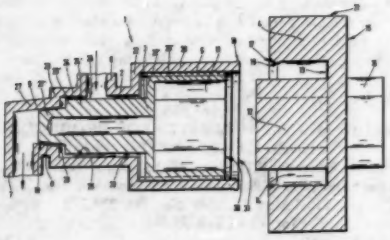
Peter von Berg, Neukeferloh, Fed. Rep. of Germany, assignor to Peter Von Berg Extrakorporale Systeme Medizintechnik, Kirchseeon/Eglharting, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 165,951

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727816; Jan. 9, 1987, 3700502; Japan, Dec. 15, 1986, 3642182

Int. Cl.[5] A61M *5/005*

U.S. Cl. 137—614.18 **13 Claims**



1. A metering device for adjusting a flow rate of a liquid to be infused into or taken out from the body of a living being, comprising:

adjusting means including an inlet means for admitting liquid into the metering device and outlet means for discharging liquid from the metering device, and two adjusting members defining therebetween a flow passage from said inlet means to said outlet means, one of said adjusting member being rotatable relative to another adjusting member to adjust a flow resistance of said flow passage and thus the flow rate of the liquid passing therethrough;

actuating means disengageably-engageable with said adjusting means to induce rotation of said one adjusting member relative to another; and

locking means provided on said actuating means and said adjusting means and adapted to effect engagement of said actuating means with said adjusting means and connect them to each other in a key-locking manner, said locking means being constructed so that said actuating means can be disengaged from said adjusting means in any adjusted position of said adjusting means to thereby avoid unintentional or erroneous adjustment of said two adjusting members relative to each other.

4,953,595

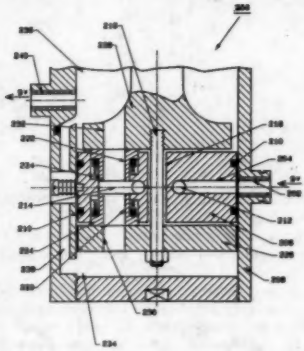
MUD PULSE VALVE AND METHOD OF VALVING IN A MUD FLOW FOR SHARPER RISE AND FALL TIMES, FASTER DATA PULSE RATES, AND LONGER LIFETIME OF THE MUD PULSE VALVE

Oleg Kotlyar, Salt Lake City, Utah, assignor to Eastman Christensen Company, Salt Lake City, Utah

Continuation of Ser. No. 79,092, Jul. 29, 1987, abandoned. This application May 10, 1989, Ser. No. 349,777

Int. Cl.[5] F16K *3/02*

U.S. Cl. 137—624.13 **8 Claims**



1. A mud pulsing valve, comprising: a body;

a stator disposed within said body, said stator having at least two opposing surfaces, said stator having a plurality of stator ports therein, said stator ports extending between said opposing surfaces;

a rotor rotatively disposed within said body and rotatable relative to said stator, said rotor having a plurality of ports defined therethrough, said rotor having first and second portions, a first portion proximate a first of said opposing surfaces of said stator and a second portion proximate the second of said opposing surfaces of said stator, said stator ports being cooperatively arranged and configured within said stator relative to said rotor ports in an analogous geometric configuration as said rotor ports are arranged and configured within said rotor, so that a predetermined rotation of said rotor relative to said stator causes simultaneous opening and closing of passages formed by said stator and rotor ports, one of said passages being opened when one of said stator ports and a rotor port are at least partially aligned with each other and said passage being closed when no portion of said one of said stator ports overlaps any portion of a rotor port;

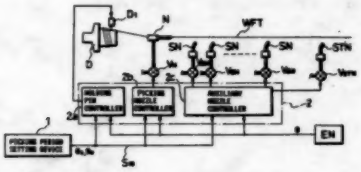
whereby the rotor ports extending through both opposing surfaces of said rotor substantially simultaneously aligned with the stator ports extending respectively through both opposing surfaces of said stator.

4,953,596

PICKING PERIOD SETTING DEVICE FOR A LOOM

Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan

Filed Sep. 12, 1989, Ser. No. 405,974
Claims priority, application Japan, Sep. 16, 1988, 63-233197
Int. Cl.[5] D03D 47/36
U.S. Cl. 139—435.1 8 Claims



1. A picking period setting device for a loom said loom having shedding curves, heddle frames, a main shaft, said heddle frame having a curved shedding stroke, said loom further having reed beating angles and for producing cloth and having a crank angle, comprising:

shedding curve calculating means for calculating the shedding curves representing the positional variation of the heddle frames of the loom with the crank angle of the main shaft of the loom;

desired shedding stroke calculating means for calculating desired shedding stroke curves representing the variation of the shedding strokes of the heddle frames as a function of a weft yarn passing range defined on the reed, beating angle, the position of the cloth fell and the crank angle of the loom; and

appropriate picking period deciding means for deciding an appropriate picking period on the basis of comparison of the shedding curves and the desired shedding stroke curves

4,953,597

APPARATUS FOR ADJUSTING WEFT THREAD LENGTHS BY CHANGING THE LENGTH OF WEFT THREAD SUPPLY PATH

Philippe Van Bogaert, Schaarbeek, and Frank Ampe, Lefflinge-Middelkerke, both of Belgium, assignors to Picanol N.V., Belgium

Division of Ser. No. 355,127, May 16, 1989, Pat. No. 4,901,722, which is a continuation of Ser. No. 98,386, Sep. 18, 1987, abandoned. This application Jul. 31, 1989, Ser. No. 386,601
Claims priority, application Belgium, Sep. 23, 1986, 2/61057
Int. Cl.[5] D03D 47/34
U.S. Cl. 139—452 5 Claims

1. In an apparatus for controlling insertion of a weft thread into a weaving loom shed, said apparatus including an accumulator drum, an insertion device and supply means including a surface of said drum for supplying weft thread to said insertion device along a predetermined path which coils around the drum a predetermined number of times, the improvement comprising:

thread guiding means comprising at least two moveable thread locking elements located adjacent to the drum surface for engaging the drum surface in a radial direction to retain the weft thread coils on the drum and for disengaging the drum surface in said radial direction to release the weft thread coils from the drum;

drive means for automatically moving the thread locking elements relative to the surface of the drum in a direction other than said radial direction in order to control the amount of thread supplied to the insertion device during release of the weft thread coils; and

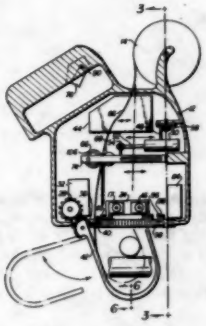
control means for controlling the amount by which the drive means moves said locking elements in said direction other than said radial direction.

4,953,598

WIRE TYING TOOL FOR CONCRETE REINFORCING STEEL

William M. McCavey, 1830-C Ashborough Ct., Marietta, Ga. 30067

Filed Apr. 13, 1989, Ser. No. 337,484
Int. Cl.[5] B21F 9/02
U.S. Cl. 140—57 11 Claims



1. A tool for making wire ties about reinforcing bars on the like, comprising:

means for feeding a first end of the wire from a supply source with said wire remaining connected to the supply source;

means for guiding said wire around the members to be tied;

means for moving said wire from the supply source into substantially parallel alignment with said first end of said wire;

means for clamping said wire from the supply source to said first end of said wire; and

means for separating said wire from the supply source.

4,953,599

METHOD OF GRIPPING A STRAP FOR BONDING THE STRAP END PORTIONS TO EACH OTHER

Kanami Kato, Sakai, Japan, assignor to Signode Corporation, Glenview, Ill.

Filed Jul. 17, 1989, Ser. No. 380,490
Int. Cl.[5] B21F 15/06
U.S. Cl. 140—93.4 6 Claims

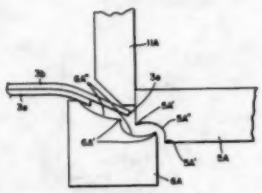
1. A method for gripping a portion of a binding strap to be used in an article binding operation wherein the strap is supplied from a supply source, encircled about the article to be bound such that a leading end portion of said binding strap is disposed in overlapping relationship with a trailing end portion of said binding strap which, in turn, is integrally connected to a residual supply portion of said binding strap supplied from said supply source, said residual supply portion of said binding strap is retracted while a portion of said binding strap disposed upstream of said leading end portion of said binding strap is securely gripped so as to impart a predetermined amount of tension within said binding strap for securely binding said

article to be bound, and wherein said trailing end portion of said binding strap is to be severed by cutting means from said residual supply portion of said binding strap after said overlapped leading and trailing end portions of said binding strap have been bonded to each other so as to bind said article to be bound under tensioned conditions, said method for gripping said portion of said binding strap disposed upstream of said leading end portion of said binding strap comprising the steps of:

providing upon said cutting means at least two laterally spaced convex gripping portions and at least one concave gripping portion interposed and defined between said at least two laterally spaced convex gripping portions;

providing upon a jaw member at least two laterally spaced convex gripping portions and at least one concave gripping portion interposed and defined between said at least two laterally spaced convex gripping portions;

laterally positioning said cutting means and said jaw member such that one of said at least two laterally spaced convex



gripping portions of said cutting means is laterally aligned with and disposed within said at least one concave gripping portion of said jaw member, while one of said at least two laterally spaced convex gripping portions of said jaw member is laterally aligned with and disposed within said at least one concave gripping portion of said cutting means;

inserting said portion of said binding strap disposed upstream of said leading end portion of said binding strap between said convex and concave gripping portions of said cutting means and said jaw member; and

moving said cutting means and said jaw member relatively toward each other such that said convex and concave gripping portions of said cutting means and said jaw member grip said portion of said binding strap disposed upstream of said leading end portion of said binding strap in an undulated manner so as to securely grip said portion of said binding strap disposed upstream of said leading end portion of said binding strap while said binding strap is being tensioned.

4,953,600

METHOD AND APPARATUS FOR TRANSFERRING A PREDETERMINED PORTION TO A CONTAINER

Claude Tribert, Bedminster, and Felix R. Grat, Parsippany, both of N.J., assignors to Howden Food Equipment, Inc., Boston, Mass.

Filed Apr. 14, 1989, Ser. No. 338,873
Int. Cl.[5] B65B *3/04*
U.S. Cl. 141—1 **21 Claims**

19. A method for delivering a predetermined amount of material to a container comprising

receiving at a delivery zone transfer receptacles each filled with a predetermined amount of material to be delivered to a container,

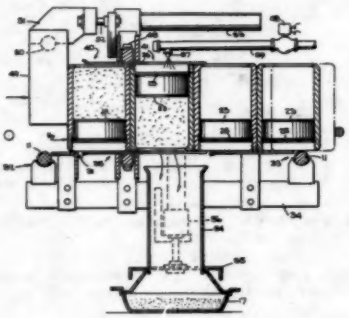
discharging the predetermined amount filled into each successive transfer receptacle into a succession of containers at a delivery zone, and

returning the empty transfer receptacles for subsequent filling, wherein the step of discharging the contents of successive transfer receptacles comprises:

(a) shifting a filled transfer receptacle upon arrival at the delivery zone into a first station adjacent to the arriving containers;

(b) rotating the receptacle in the first station 180° about an axis parallel to the shifting direction while covering the open top of the receptacle to prevent discharge of the contents therefrom;

(c) shifting a subsequently arriving filled transfer receptacle into the first station, the latter receptacle displacing the inverted previous receptacle into a second station adjacent to the first station;



(d) uncovering the open top of the inverted receptacle in the second station to discharge the contents of that receptacle into one of a line of containers passing underneath the delivery zone;

(e) rotating the receptacles in the first station 180° about the axis defined in step (b); and

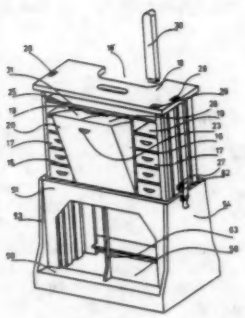
(f) repeating steps (c) and (e) as successive filled receptacles arrive at the delivery zone.

4,953,601

TRANSFORMABLE TOOL-BOX

Julien Herdies, Archennes, Belgium

PCT No. PCT/BE87/00010, § 371 Date Apr. 10, 1989, § 102(e) Date Apr. 10, 1989, PCT Pub. No. WO88/10176, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 25, 1987, Ser. No. 353,646
Int. Cl.[5] B25H *3/02, 1/12*
U.S. Cl. 144—285 **12 Claims**



1. A tool box for storing tools and the like, comprising, in combination:

(a) a female enclosure open at its upper end, and having a base, a pair of side walls, and a pair of front and rear walls having openings therein;

(b) a male box assembly vertically slidably mounted in said female enclosure between a first position and a second position, said male box assembly comprising a pair of side walls, a base and a top horizontal work surface, and a plurality of slidably mounted drawers located in two spaced vertical columns on opposite sides within said male box assembly and defining a cavity therebetween;

(c) locking means for securing said male box assembly in said first position within said female enclosure; and

(d) an outwardly pivotally mounted tool tray carried within said male box assembly in the cavity between the said vertical columns of drawers.

4,953,602

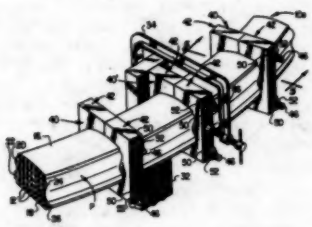
APPARATUS AND ASSOCIATED METHODS FOR FORMING CURVED WOODEN HAND RAILS FOR SPIRAL STAIRCASES AND THE LIKE

Lynn H. Smith, Rt. 1 - Box 110, Gunter, Tex. 75058

Filed Dec. 8, 1989, Ser. No. 447,626

Int. Cl.[5] B27D *1/00*; B27H *1/00*

U.S. Cl. 144—349 **16 Claims**



12. A method of constructing a curved staircase handrail comprising the steps of:

providing a series of elongated flexible laminae having laterally facing side surfaces;

applying an adhesive material to at least some of said side surfaces;

positioning said laminae in a laterally abutting relationship to form therefrom an elongated flexible bending rail having, along its length, an exterior surface contour defined by generally laterally facing opposite first and second side surfaces extending between third and fourth opposite side surfaces; and

utilizing surfaces of opposed pairs of clamping members, positioned at longitudinally spaced sections of the bending rail, to conformingly engage and exert uniformly distributed, laterally directed clamping forces along longitudinally spaced sections of said first and second side surfaces, each clamping member pair additionally engaging longitudinal sections of said third and fourth side surfaces in a manner preventing relative shifting of the laminae in a direction parallel to the side surfaces thereof.

4,953,603

TOWEL-PROTECTING COVER ASSEMBLY

Richard S. Holden, 1626 Hampton Rd., Abington, Pa. 19001

Filed Sep. 8, 1989, Ser. No. 404,598

Int. Cl.[5] A47K *10/12*; A63B *47/04, 57/00*

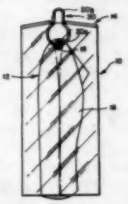
U.S. Cl. 150—154 **4 Claims**

1. A towel-protective cover assembly comprising:

a towel;

an openable fastener means, connected to one edge of said towel, for releasably securing said towel to a ring support; and

a protective cover comprising a bag fabricated of a plastic material which is at least water resistant; said bag being open at the bottom thereof and comprising four sides including a first pair of opposed sides having gussets formed therein at the top thereof, and a second pair of opposed sides which are sealed together at the top edges thereof to form a sealed upper edge portion and to seal together, to form lateral portions of said sealed upper edge, the top edges of respectively inwardly extending



portions of said first pair of sides and corresponding lateral portions of said top edges of said second pair of opposed sides so as to thereby form said gussets in said first pair of opposed sides, said sealed upper edge having a central cutout opening therein through which a portion of sad openable fastener means extends.

4,953,604

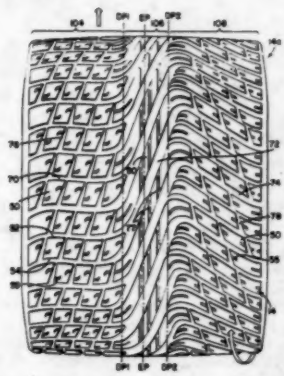
TREAD FOR A UNIDIRECTIONAL PNEUMATIC TIRE

Peter R. Shepler, Stow; Nathan A. Gammon, Akron; William M. Hopkins, Hudson; James E. Koerner, Uniontown, and Charles K. Schmalix, Canal Fulton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 25, 1989, Ser. No. 357,147

Int. Cl.[5] B60C *11/04*

U.S. Cl. 152—209 A **12 Claims**



1. A tread for unidirectional pneumatic tire, the tire being for use on paved road surfaces, the tread, when mounted on a casing, comprising:

first, second and third circumferentially extending zones, the edges of the zones being parallel to the equatorial plane of the tire, the second zone being disposed between and contiguous with the first and third zone;

the width of the first zone being between 25% and 50% of the tread width, the width of the second zone being between 15% and 35% of the tread width, the width of the third zone being between 25% and 50% of the tread width;

the first zone having substantially aligned lateral wide groove segments extending across the width of the first zone, the lateral wide groove segments, over a majority of their length in the first zone, forming an angle between 70

degrees and 90 degrees with a plane in the first zone parallel to the equatorial plane, the second zone having substantially aligned lateral wide groove segments extending across the width of the second zone, the lateral wide groove segments, over a majority of their length in the first zone, forming an angle between 10 degrees and 45 degrees with a plane in the second zone parallel to the equatorial plane; and

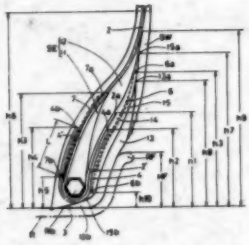
the third zone having substantially aligned lateral wide groove segments extending across the width of the third zone which are generally perpendicular to the lateral wide groove segments of the second zone, the lateral wide groove segments of the third zone, over a majority of their length in the third zone, forming an angle between 45 degrees and 70 degrees with a plane in the third zone parallel to the equatorial plane, provided that the angle of the lateral wide groove segments of the third zone are smaller than the angle of the lateral wide groove segments of the first zone.

4,953,605

REINFORCING STRUCTURE FOR BEAD PORTION OF RADIAL TIRE FOR HEAVY LOAD

Kazuhiko Kawamura, Shirakawa, and Kazuo Sato, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Japan

Continuation-in-part of Ser. No. 874,059, Jun. 13, 1986, abandoned. This application May 17, 1988, Ser. No. 194,900
Claims priority, application Japan, Jun. 13, 1985, 60-129301
Int. Cl.[5] B60C *15/06*
U.S. Cl. 152—541 **10 Claims**



1. A radial tire for heavy loads comprising:

a pair of bead parts each provided with a bead core and having a bead base part surrounding the bead core, the bead base part having a bead base radially inward of the bead core;

a carcass extending between the beads and having a ply of metallic cords laid at an angle of 90 to 60 degrees to the equatorial plane of the tire, the ends thereof turned up around the bead cords from the axially inside to outside thereof to form a carcass main part on the inside of the bead core and a carcass turned up part on the outside of the bead core extending radially outwardly;

a pair of sidewalls on the carcass extending to the bead part;

a metallic cord reinforcing layer having a ply of metallic cords and turned up around the bead core to form an outside part extending radially outwardly along the axially outside of the carcass turned up part and an inside part extending radially outwardly along the axially inside of the carcass main part;

an outside reinforcing layer having a ply of organic fiber cords and disposed axially outside from a point (h10) in the bead base part to a point (h3) beyond both the radially outer end of the metallic cord reinforcing layer and the radially outer end of the carcass turned up part;

an inside reinforcing layer having a ply of organic fiber cords and disposed on the axially inside of the carcass main part, the inside reinforcing layer extending from a point (h'3) radially outward of the radially outer end of the inside part of the metallic reinforcing layer to a point (h5) in the bead base part so as to be interposed between the carcass main part and the inside part of the metallic cord reinforcing layer;

a bead apex disposed between the carcass main part and the carcass turned up part and extending radially outwardly and decreasing in thickness from the bead core to a point (h9) beyond the radially outer end of the outside reinforcing layer;

a rubber chafer made of a hard rubber having a modulus of elasticity of 50 to 60 kgf/sq.cm at 100% elongation and a JIS (A) hardness of 75 to 85 and disposed outside the outside reinforcing layer, the rubber chafer extending radially outwardly from the bead base part, the radially outer part thereof gradually decreased in thickness toward the end thereof;

an inner sidewall made of a soft rubber having a modulus of elasticity of 15 to 25 kgf/sq.cm at 100% elongation and a JIS (A) hardness of 55 to 65 and disposed between the outside reinforcing layer and the rubber chafer,

the inner sidewall extending radially inwardly to a point in the bead base part beyond the radially inner end of the outside reinforcing layer and further extending radially outwardly to a point (h7) beyond the radially outer end of the outside reinforcing layer so as to contact with the bead apex; and

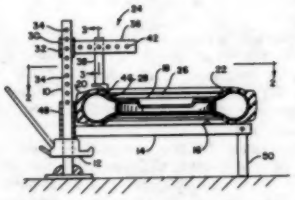
the radially outer part of the rubber chafer and the radially outer part of the inner sidewall being interposed between the bead apex and the sidewall.

4,953,606

TIRE BEAD-BREAKER

Daniel E. Brown, Jr., Rt. 2, Afton, Tenn. 37616

Continuation-in-part of Ser. No. 214,114, Jun. 30, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,565
Int. Cl.[5] B60C *25/06*
U.S. Cl. 157—1.17 **12 Claims**



1. A tire bead breaker comprising jack stanchion means adapted for substantially vertical use, jack body means mounted on said stanchion means for axial movement therealong, wheel support means functionally associated with and movable with said body means, said support means having a sleeve segment axially slidably mounted on said stanchion means above said body means and forcibly engageable by said body means in response to actuation of said jack body means, said support means further having at least one elongated member affixed at one of its ends to said sleeve segment, said member extending outwardly from said sleeve segment substantially normally to the longitudinal axis of said stanchion means to provide an unattached end and an essentially unobstructed planar bed means for supporting a wheel in substantially horizontal posture with a portion of the tire tread juxtaposed said stanchion means such that the side wall thereof faces substantially upwardly, butting means affixed to said stanchion means above said support means and substantially adjacent said stanchion means for engaging a tire side wall adjacent the tire rim to break the tire bead from said rim in response to upward

movement of said body means and support means and a wheel supported thereon.

4,953,607

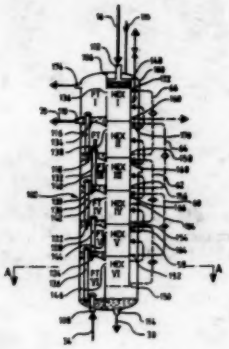
MULTISTAGE EVAPORATING SYSTEM

Kiiskila Erkki, Karhula, Finland, and Ryham Rolf, Princeton, N.J., assignors to A. Ahlstrom, Noormarkku, Finland

Continuation-in-part of Ser. No. 312,424, Feb. 17, 1989, which is a continuation of Ser. No. 110,710, Jul. 29, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 365,953

Int. Cl.[5] B01D *1/22, 1/26*

U.S. Cl. 159—13.3 **8 Claims**



1. A multiple effect evaporator system for concentrating black liquor from a sulfate cook comprising:

a plurality of successive evaporation effects having heat elements for operation at successively decreasing temperatures and pressures;

a plurality of flash tanks for expanding heated black liquor, comprising n flash tanks connected in series, each flash tank including a vapor outlet;

a plurality of heat exchangers for heating the black liquor, comprising n+1 heat exchangers connected in series, including a first heat exchanger which receives black liquor from one of the evaporator effects;

a reactor vessel for heat treatment of the black liquor comprising means for receiving black liquor from the (n+1)th heat exchanger, and means for transferring the black liquor from the reactor vessel to the nth flash tank;

means for operatively connecting the vapor outlet of each of the flash tanks to a corresponding one in the series of heat exchangers, except to the (n+1)th heat exchanger;

means for supplying steam from an external source to the (n+1)th heat exchanger; and

means for transferring the black liquor from the first of the series of flash tanks to the next, in relation to the black liquor flow, downstream evaporator effect following said one of the evaporator effects.

2. A multistage flash evaporator and heater apparatus, wherein successive evaporation stages are operated at successively decreasing temperatures and pressures to generate vapors from a heated liquor, which vapors are used to heat the same or another liquor to successively increasing temperatures in successive heating stages, said apparatus comprising:

a shell divided into a first and a second compartment by a partition wall, the first compartment having a liquor inlet in the lower portion of the shell and a liquor outlet in the upper portion of the shell, the second compartment having a liquor inlet in the upper portion of the shell and a liquor outlet in the lower portion of the shell;

a plurality of flash tanks for expanding heated liquor disposed on top of each other within the first compartment of the shell, the top wall of each flash tank, except the uppermost, constituting the bottom wall of the flash tank positioned on top thereof, each flash tank being connected operatively to the flash tank on top thereof via a riser tube, and each flash tank having a vapor outlet;

a plurality of heat exchange elements for heating the liquor introduced through the inlet in the upper portion of the shell by vapors generated by expansion of heated liquor in the flash tanks, and for condensing the heating vapor, said heat exchange elements being positioned on top of each other within the second compartment of the shell, each heat exchange element having a vapor inlet and a condensate outlet;

means for connecting the vapor outlet of each flash tank to the vapor inlet of a corresponding one in the series of the heat exchange elements, the number of flash tanks being the same as the number of heat exchange elements in series;

means for connecting the condensate outlet of each heat exchange element, except the uppermost, to the next, in relation to the liquor flow, upstream heat exchange element;

means for distributing the liquor on the surface of the uppermost heat exchange element; and

means for passing the liquor from the heat exchange element of one stage to a subsequent stage.

4,953,608

SAFETY DEVICE, PARTICULARLY FOR ROLL-UP DOORS

Nils H. I. Larsson, Halmstad, Sweden, assignor to Nomafa AB, Halmstad, Sweden

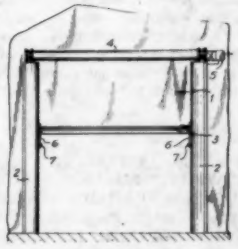
PCT No. PCT/SE87/00405, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO88/02804, PCT Pub. Date Apr. 21, 1988

PCT Filed Sep. 9, 1987, Ser. No. 340,418

Claims priority, application Sweden, Oct. 9, 1986, 8604283

Int. Cl.[5] E05F *15/20*

U.S. Cl. 160—1 **8 Claims**



1. A safety device, particularly intended for use in a roll-up door, said roll-up door including a roll-up door leaf extending horizontally between two upright posts defining a width for said roll-up door, said roll-up door further including an upper cross beam onto and off of which said door leaf is wound to open and close said roll-up door, respectively, and a lower cross beam connected to a bottom edge of said door leaf, said bottom edge of said door leaf being adjacent to a plane base surface when said roll-up door is in a closed position, said safety device comprising at least one signal emitting means (7) which is arranged to emit a signalling beam across the width of the door-leaf at a distance below the lower cross beam on said bottom edge of the door-leaf so that any object, obstructing a movement of the roll-up door into said closed position, interrupts the signalling beam emitted by the signalling means and causes a stopping of the closing movement of the door-leaf before the bottom edge thereof hits said object, characterized therein that the signal emitting means (7) is mounted on a

support arm (9) which is slideably mounted in a holder (8) mounted on said lower cross beam, said support arm (9) arranged to abut against said plane base surface upon closing of the door so that the signal emitting means are displaced relatively to and towards the door-leaf to a position at least in level with the bottom edge of said door-leaf during the final closing movement thereof.

4,953,609

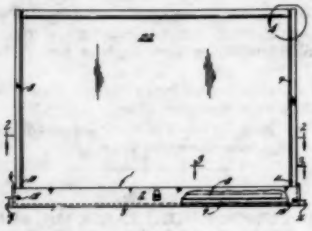
PORTABLE SCREEN

David R. Annin, 4542 SE. 104th Ave., Portland, Oreg. 97266, and Rusty L. Kelley, 8324 NE. Sumner, Portland, Oreg. 97220

Filed Sep. 11, 1989, Ser. No. 405,653

Int. Cl.[5] A47H *7/00*

U.S. Cl. 160—24 **7 Claims**



1. A portable screen comprising,

an enclosure having front, rear, end and bottom walls,

a roller mounted screen in place on one of said walls and including a rigid cross member at the screen outer end,

a pair of vertically positionable unitary tubular leg members having upper ends when vertically positioned receiving said cross member to support same and the screen when extended,

adjustable pivot means attaching the remaining ends of said leg member to the interior of said enclosure,

a partition having movable end portions frictionally engageable with said remaining ends of said leg members to retain same against undesired pivotal movement, and

said adjustable pivot means in threaded engagement with said end portions to urge same into biased engagement with said leg members to retain the leg members in upright positions.

4,953,610

DOUBLE WINDOW SHADE ASSEMBLY WITH INDEPENDENT SHADE MOVEMENT

William R. Phillips; Blaine A. Bush, both of Lakewood; John J. O'Brien, Littleton, and Charles R. Thalken, Denver, all of Colo., assignors to Ultimate Window Coverings, Inc., Lakewood, Colo.

Filed Mar. 17, 1989, Ser. No. 325,375

Int. Cl.[5] E06B *3/94*

U.S. Cl. 160—84.1 **10 Claims**

1. A window shade assembly adapted to be used with a window frame having a first end and a second end, comprising:

a first pleated shade;

first means for moving said first pleated shade;

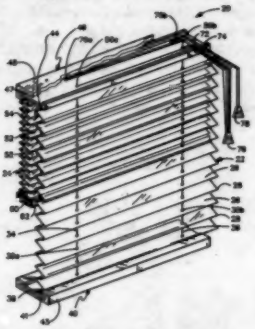
a second pleated shade independently movable relative to said first pleated shade, said first and second pleated shades being positioned in a front-to-back relationship;

second means for moving said second pleated shade;

first header beam means connected to said first pleated shade and movable relative to the window frame with said first pleated shade; and

second header beam means connected to said second pleated shade and movable relative to the window frame with said second pleated shade;

wherein said first header beam means has a width greater than the width of said second header beam means and is detached therefrom, with said second header beam means being movable relative to said first header beam means but, when said first header beam means is moved in a substantially vertical direction, said second header beam



means is adapted to be contacted by portions of said first header beam means so that said first header beam means and said second header beam means are able to move vertically together using said first header beam means movement.

4,953,611

PARTITION WALL CONSISTING OF DOUBLE-WALLED PANELS COUPLED PIVOTALLY TO EACH OTHER

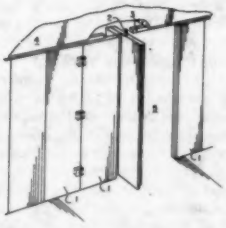
Markus F.J. Verstraten, Maasbree, Netherlands, assignor to Pella B.V., Netherlands

Filed Apr. 7, 1989, Ser. No. 334,447

Claims priority, application Netherlands, Apr. 11, 1988, 8800936

Int. Cl.[5] E05D *15/12*

U.S. Cl. 160—199 **18 Claims**



1. A partition wall for an opening comprising a plurality of panels movable between an extended closed position and a retracted open position, said panels having spaced opposite walls and including upper and lower edges connected by opposite side edges, adjacent panels having adjacent side edges thereof pivotally connected to one another, a guide rail disposed above and adjacent the upper edges of said panels, a pair of alternate panels each having a guide member disposed substantially at the center portion of the upper edge thereof and extending upwardly therefrom for engaging said guide rail, an intermediate panel disposed between said alternate panels and pivotally interconnected therewith, said intermediate panel including movable guide means extending upwardly from the upper edge thereof for engaging said guide rail, said guide means being movable toward and away from one of the side

edges of said intermediate panel, and biasing means biasing said guide means toward said one side edge.

4,953,612

COMPOSITE METAL ARTICLES

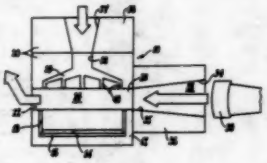
Ian R. Sare, Coromandel Valley; Ian Henderson, Glen Osmond; Teunis Heijkoop, Highbury; Michael R. Bosworth, Walkerville; Ronald E. Aspin, Henley Beach, and Brian K. Arnold, Panorama, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organization and Vida-Weld Pty. Limited, both of, Australia

Continuation of Ser. No. 266,301, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 914,817, Oct. 3, 1986, abandoned. This application Jun. 2, 1989, Ser. No. 361,753

Claims priority, application Australia, Jul. 5, 1983, PG0130; Nov. 22, 1983, PG2499; Nov. 22, 1983, PG2500

Int. Cl.[5] B22D *19/08*

U.S. Cl. 164—102 **10 Claims**



1. A composite metal article having a first component and a second component, wherein said second component is cast against a bond surface of the first component, said article being characterized by a diffusion bond between said components obtained on solidification of melt providing said second component substantially without fusion of said bond surface; wherein said first component is a ferrous metal and said second component is selected from the group consisting of a ferrous metal and a cobalt base alloy and said diffusion bond is formed by:

(a) applying a flux coating over said bond surface of said first component after rendering said surface substantially oxide-free;

(b) preheating said first component to a preheat temperature of about 350° to about 800° C.; and

(c) pouring said melt of said second metal to provide said second component, said melt being poured at a superheated temperature and such that said melt flows over said bond surface to thereby displace said flux coating from said bond surface and wet said bond surface, said superheat temperature being substantially in excess of said preheat temperature, whereby said melt raises the temperature of said bond surface to achieve an initial temperature equilibrium between said surface and the melt, and a substantially instantaneous interface temperature therebetween which is at least equal to the liquidus temperature of the melt, such that on solidification of the melt said bond substantially in the absence of fusion of said bond surface is attained between the components.

4,953,613

LIFTING DEVICE ON A CONTINUOUS CASTING MOLD

Werner Schumers, Meerbusch, Fed. Rep. of Germany, assignor to Thyssen Edelstahlwerke AG, Fed. Rep. of Germany

Continuation of Ser. No. 176,762, Apr. 1, 1988, abandoned, which is a continuation of Ser. No. 162,795, Feb. 26, 1988, abandoned. This application Jan. 5, 1990, Ser. No. 462,858

Int. Cl.[5] B22D *11/04*

U.S. Cl. 164—416 **5 Claims**

1. Lifting device in combination with a continuously casting mold of the type having a rotating drive (B) and two rotatingly driven eccentric shafts (A) which are articulated to an elevating platform for the continuous casting mold or directly to the continuous casting mold, wherein at least one Cardan shaft (D) which meets at least one of following two conditions is operatively coupled at a first end thereof to said two eccentric shafts (A) via a first joint head (G) and a flanged coupling (L) and operatively coupled at a second end thereof remote from said first end via a second joint head (H) to said rotating drive (B):

(a) the position of said second joint head (H) is adjustable so as to vary an angle between said at least one Cardan shaft and a horizontal plane defined through said first joint head,

(b) the first and second joint heads are mutually rotatable.

4,953,614

MODULAR CONTINUOUS CASTER

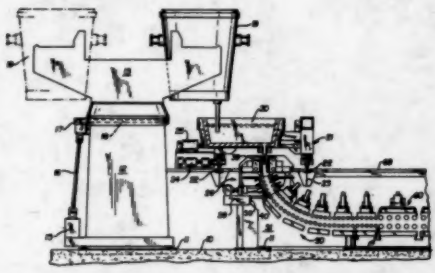
Herbert Lemper, 130 Canterbury Rd., McMurray, Pa. 15317

Continuation-in-part of Ser. No. 147,222, Jan. 22, 1988, Pat. No. 4,799,535, which is a continuation of Ser. No. 36,407, Apr. 9, 1987, abandoned. This application Jan. 24, 1989, Ser. No. 301,227

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] B22D *11/00, 11/08*

U.S. Cl. 164—416 **13 Claims**



1. In a continuous caster of the type having a mold assembly followed by a plurality of roll segments and related components for handling and treating a cast strand discharged from beneath the mold, a mold oscillator apparatus comprising:

a mold oscillator frame including structural legs supporting an upper base frame portion;

a pair of spaced shafts, each shaft having first and second ends mounted for rotation on the upper base frame portion, the first and second ends having offset cylindrical portions thereon, four bearing blocks joined on the eccentric shafts adjacent the first and second ends thereof and defining eccentrics at said shaft ends;

a pair of elongated, wide flange beam members having upper and lower flanges interconnected by a web, each beam extending above one of the pair of spaced eccentric shafts and mounted on a lower flange respectively at each end to one of the bearing blocks of the eccentrics;

said oscillator base frame including a mold table comprising a planar frame-like structure adapted to support the mold thereon, said mold table, rigidly secured to the respective upper flanges of said beam members;

oscillator drive means for rotating said pair of shafts and said eccentrics at a controlled rate whereby a controlled vertical oscillatory motion is transmitted from said eccentrics

through the web portions of said wide flange beams to the mold table and thence to the mold situated thereon.

8. In a continuous caster of the type having a mold assembly followed by a plurality of roll segments and related components for handling and treating a cast strand, a straightening module comprising:

a frame means having slots therein to compensate for thermal expansion;

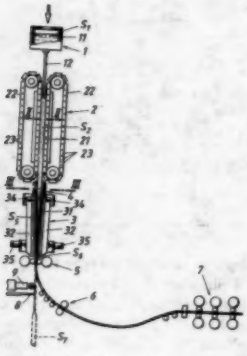
a plurality of spaced-apart roll sets defining a plurality of strand bending points therealong whereby a cast strand entering said straightening module passes through said roll sets and is bent from a curved to a straight configuration.

4,953,615

PLANT FOR THE CONTINUOUS CASTING OF STEEL

Anton Hulek, Goglerfeldgasse 15, A - 4020 Linz, Austria

Filed Jan. 24, 1989, Ser. No. 301,315
Claims priority, application Austria, Feb. 1, 1988, 193/88
Int. Cl.[5] B22D *11/00*
U.S. Cl. 164—417 **10 Claims**



1. A plant for the continuous casting of molten steel into a strand of a flat planoparallel cross-section, which comprises

(a) a first stage comprising a mold defining a mold cavity of a constant cross-section of flat parallelogram shape, the mold having means for cooling the molten steel as it moves downwardly through the mold cavity until a strand of steel having a solid shell has been formed therein and the steel has been entirely solidified at the narrow sides thereof, and

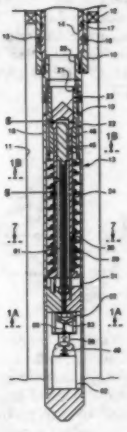
(b) a second stage succeeding the first stage and comprising a second, separate strand deforming mold defining a mold cavity having an entrance portion arranged to receive the moving strand from the first stage mold, the entrance being of substantially the same cross-section as the first-stage mold and the mold cavity of the deforming mold tapering towards an exit portion thereof in the narrower dimension of its parallelogram cross-section to be of flat planoparallel shape.

4,953,616

SOLENOID ACTUATOR AND PULSE DRIVE

Louis H. Borden, Los Altos, and T. Charles Moore, Sunnyvale, both of Calif., assignors to Develco, Inc., San Jose, Calif.

Filed Apr. 14, 1988, Ser. No. 181,599
Int. Cl.[5] E21B *34/10*
U.S. Cl. 166—66.4 **5 Claims**



1. A control actuator for controlling operation of a device located downhole in a well from a location which is remote from said device, comprising:

A. means defining a self-contained source of power to be positioned with said device at the downhole location;

B. control means to be positioned with said device at the downhole location, responsive to receipt of a signal defining when it is desired that the device operate downhole in a selected operating state by indicating said operating state;

C. latch means to be positioned with said device at said downhole location, operatively connected to said control means and said power source means and responsive to said control means indicating said operating state by suing energy from said power source means to maintains aid device in said operating state as long as said power source means is capable of maintaining a power output greater than a predetermined threshold level; and

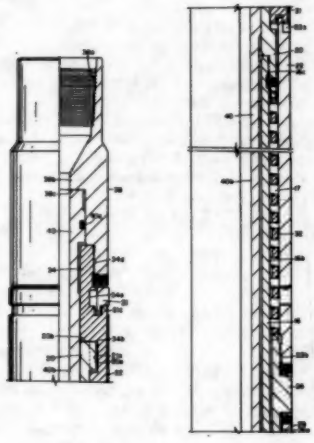
D. means as part of said control means for directing a train of pulses generated from said power source means to said latch means as long as said power means is capable of furnishing energy to assure that the average power output provided by said pulses is greater than said predetermined threshold level, said pulse train directing means including means to assure that if said pulse train directing means provides a voltage at a steady-state level, then the power directed to said device will be decreased to below the level required to maintain said device in said selected operating state.

4,953,617

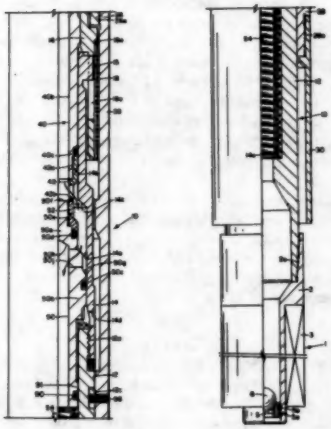
APPARATUS FOR SETTING AND RETRIEVING A BRIDGE PLUG FROM A SUBTERRANEAN WELL

Richard J. Ross, and Jim H. Roddy, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 19, 1989, Ser. No. 423,889
Int. Cl.[5] E21B *33/127, 34/06*
U.S. Cl. 166—187 14 Claims



1. A bridge plug comprising:
a tubular body supporting an annular inflatable element;
a tubular valve housing operatively secured at its lower end to said tubular body;
said tubular valve housing defining in its medial portions three vertically spaced, internal seal bores with the middle seal bore having a larger diameter than the upper and lower seal bores, thereby defining a downwardly facing shoulder;
a generally cylindrical valve plug having a solid upper end on a tubular lower portion;
a radial port in said tubular lower portion;
a first external seal element below said radial port sealably engagable with said middle seal bore;
a second external seal element above said radial port engagable with said upper seal bore when said valve plug abuts said downwardly facing shoulder;
a third seal element below the middle seal engagement with the lower seal bore;
resilient means disposed within the lower portions of said tubular valve housing urging said valve plug into abutting engagement with said downwardly facing shoulder, thereby achieving a closed position preventing fluid flow through said valve plug into said inflatable element; and
port means in said tubular valve housing below said middle seal bore for applying the pressure of surrounding well fluids to the exterior of said valve plug, thereby urging said valve plug to said closed position and balancing the well fluid forces on said valve plug when said valve is in said closed Position, whereby said valve plug may be readily shifted upwardly to said closed position by said resilient means and downwardly to an open position by a small downward force exerted by a running tool and sufficient to overcome the force of said resilient means.

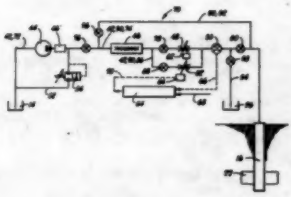


4,953,618

INJECTION MANIFOLD AND METHOD

Syed Hamid, Duncan; Jackie K. Lucas, Marlow, both of Okla., and Russell R. Lockman, Williston, N. Dak., assignors to Haliburton Company, Duncan, Okla.

Filed Jan. 12, 1989, Ser. No. 296,265
Int. Cl.[5] E21B *49/00*
U.S. Cl. 166—250 19 Claims



1. An apparatus for use on a well, said apparatus comprising:
a first line interconnecting a fluid supply reservoir with said well;
pumping means for pumping fluid from said supply reservoir to said well;
metering means in said first line for measuring a fluid flow rate through said first line;
valve means in said first line for adjusting fluid flow therethrough in response to said fluid flow rate;

bypass means for adjusting a discharge pressure of said pumping means;

a second line interconnecting said well with a discharge reservoir; and

second valve means for adjusting fluid flow through said second line from said well to said discharge reservoir in response to a second fluid flow rate through said metering means in a flow- back test.

4,953,619

ENHANCED OIL RECOVERY PROCESS

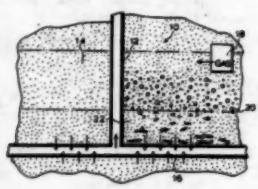
Francis A. Dullien; Ioannis Chatzis, and Ian F. Macdonald, all of Waterloo, Canada, assignors to University of Waterloo, Waterloo, Canada

Continuation-in-part of Ser. No. 377,775, Jul. 7, 1989, abandoned, which is a continuation of Ser. No. 268,603, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 106,792, Dec. 13, 1987, abandoned. This application Oct. 17, 1989, Ser. No. 422,503

Claims priority, application United Kingdom, Oct. 10, 1986, 8624387

Int. Cl.[5] **E21B** *33/138, 43/12, 43/16*

U.S. Cl. 166—265 **8 Claims**



1. A method for recovery of oil from a water-wet porous formation containing oil which comprises:

introducing a gas into an upper part of said formation to permit the gas to enter and pass through the pores at a flow rate of about 10^{-2} ft/day to about 1 ft/day,

mobilizing said oil by spontaneously spreading to form an oil film on water upon contact with the gas,

draining said oil films from pores filled with gas to pass downwardly through the formation and gradually accumulate more oil at a rate determined by gravitational forces,

forming from said drained oil films a continuous oil mass migrating downwardly in the formation at a rate determined by gravitational forces, and

discharging said continuous oil mass to a well bore from which the oil is recovered to a surface location.

4,953,620

ACCELERATING SET OF RETARDED CEMENT

J. Benjamin Bloys, Plano; Robert B. Carpenter, Hurst, and William N. Wilson, Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 14, 1989, Ser. No. 393,546

Int. Cl.[5] **E21B** *33/138, 33/14, 33/16*

U.S. Cl. 166—293 **7 Claims**

1. In a method of treating cement in a well completed into subterranean formations for producing a desired hydrocarbonaceous fluid therefrom which includes the steps of:

a. squeezing highly retarded cement into said annular voids or perforations;

the improvement comprising:

washing over said cement with a solution of a compatible organic accelerator comprising a material that will produce a formate ion in the cement slurry and selected from the class consisting of formamide, formic acid, salt of formic acid, and ester of formic acid.

6. In a method of setting a volume of cement in a well completed in subterranean formations, in which a cement is or may become retarded and is pumped into said well and allowed to set to form a hard cementitious material therewithin, the improvement comprising:

contacting by admixing at the surface said cement with a solution of a compatible organic accelerator comprising material that will produce formate ions in the cement slurry; said compatible organic accelerator being formamide, said formamide being admixed with said cement slurry initially in a concentration within the range of 0.05–2.5 gallons of formamide per barrel of cement slurry.

4,953,621

ORGANIC TITANIUM COMPOSITIONS USEFUL AS CROSS-LINKERS

Donald E. Putzig, Newark, and Kenneth C. Smeltz, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 77,020, Jul. 23, 1987, abandoned, which is a continuation of Ser. No. 714,513, Mar. 21, 1985, abandoned. This application May 9, 1989, Ser. No. 349,881

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[5] **E21B** *43/26, 43/267*

U.S. Cl. 166—308 **28 Claims**

1. A composition comprising an aqueous solution containing at least two titanium compounds at least one of which effects cross-linking of hydroxyl-containing materials more rapidly than the other titanium compound, each of which titanium compounds is the reaction product of a polyol, water and an α-hydroxycarboxylic acid plus a tetravalent titanium compound of an inorganic acid, the relative amounts of the titanium compounds being such that the cross-linking rate of the solution is intermediate those of the titanium compound in the solution that has the most rapid cross-linking rate and the titanium compound in the solution having the slowest cross-linking rate, said polyol being selected from glycerol, erythritol, arabitol, xylitol, sorbitol, dulcitol, mannitol, inositol, monosaccharides, and disaccharides, and said α-hydroxycarboxylic acid being selected from lactic acid, glycolic acid, malic acid, citric acid, tartaric acid, saccharic acid, gluconic acid, glyceric acid and mandelic acid, each of said titanium compounds having an α-hydroxycarboxylic acid:titanium mol ratio between about 1:1 about 3:1, a polyol:titanium mol ratio between about 0.25:1 and about 2:1, and a water:titanium mol ratio between about 36:1 and about 60:1, and the volume:-volume ratio of the titanium compound that has the most rapid cross-linking rate to the titanium compound having the slowest cross-linking rate being in the range between about 10:1 to about 1:10.

8. In a hydraulic fracturing process wherein a aqueous cross-linked polysaccharide gel is introduced into a subterranean oil- or gas-contained formation at a flow rate and pressure sufficient to create or extend one or more fractures therein, the improvement comprising effecting cross-linking of the gel with the composition of claim 1.

4,953,622

SUBTERRANEAN WELL CASING FLOAT TOOL

Douglas J. Lehr, Houston; Merle L. Bell, New Waverly; Richard P. Rubbo, The Woodlands; all of Tex., and Richard L. Forehand, Jurung, Sweden, assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 252,043, Sep. 30, 1988, Pat. No. 4,872,510. This application Aug. 14, 1989, Ser. No. 392,906

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.[5] **E21B** *34/08;* **F16K** *15/00*

U.S. Cl. 166—327 **7 Claims**

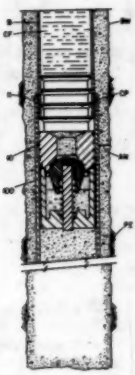
1. A subterranean will casing float tool, comprising:

(a) a tubular metal housing securable to a well casing conduit;

(b) valving means implaced within said housing, said valving means comprising:

(1) a frame;

(2) valve head and valve seat means operatively carried relative to said frame and selectively movable relative to one another from an open position to a closed position;



(3) biasing means for relatively urging said valve head toward said valve seat means;

(4) a compartment including said valve head for enclosure around the biasing means when the valve head is moved fully away from the valve seat means; and

(c) means for directly securing said valving means to said housing.

4,953,623

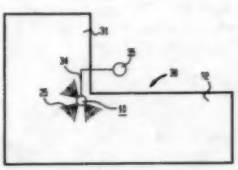
PROTECTED L-SHAPED ENVIRONMENT USING SINGLE CHEMICAL NOZZLE

Donald W. Applegate, Jamesburg, N.J., assignor to Pem All Fire Extinguisher Corporation, Cranford, N.J.

Filed Mar. 16, 1989, Ser. No. 324,386

Int. Cl.[5] A62C *37/10*

U.S. Cl. 169—37 **7 Claims**



1. A protected environment, comprising:

space defining means having a horizontal base member and a wall member extending substantially vertically upward from said horizontal base member, said wall member defining a substantially L-shaped area on said base member having first and second protected regions adjacent to one another;

coupling means having first and second coupling ends, said first coupling end for connecting to the supply of the fire suppression fluid, and said second coupling end being arranged within said substantially L-shaped area distal from said base member, in the vicinity where said first and second protected regions join one another; and

a nozzle member coupled to said second coupling end of said coupling means, said nozzle member having a chamber wall for defining a distribution chamber having an input port for communicating with the supply of the fire suppression fluid and receiving the fire suppression fluid, and exclusively first, second, and third nozzle apertures disposed through said chamber wall for directing the fire suppression fluid in said distribution chamber toward the first and second protected regions of said substantially L-shaped area, said first and second ones of said nozzle apertures being arranged substantially axially parallel with respect to each other, and said third nozzle aperture being arranged substantially orthogonal to said first and second ones of said nozzle apertures, said chamber wall, except for said first, second, and third nozzle apertures, being impermeable.

4,953,624

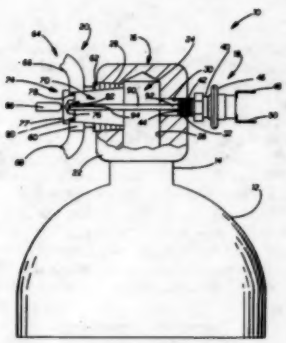
CYLINDER PRESSURE SWITCH FOR AUTOMATIC FIRE PROTECTION SYSTEMS

Mark L. Turner, Grand Rapids, Mich., assignor to Convenience Marine Products, Inc., Grand Rapids, Mich.

Filed Jul. 17, 1989, Ser. No. 380,855

Int. Cl.[5] A62C *37/22*

U.S. Cl. 169—60 **18 Claims**



1. A fire extinguisher for an engine compartment or the like, said extinguisher including:

a pressure vessel having an outlet;

a manifold secured to said vessel, said manifold defining a passage having an inlet aligned with said vessel outlet and a manifold outlet, said manifold further defining a switch passage communicating with said passage outlet;

a head having a body defining a nozzle, a frame, a cap disposed within said nozzle and a thermally responsive trigger engaging said cap;

a pressure switch disposed within said switch passage said switch being actuated by a reduction in pressure; and

accelerator means operatively connected to said pressure switch for accelerating switch actuation upon release of said cap.

4,953,625

ADJUSTABLE, PIVOTABLE BLADE FOR BULLDOZERS AND THE LIKE

Samuel G. Hurworth, Port Angeles, Wash., assignor to Delhur Industries, Inc., Port Angeles, Wash.

Filed Mar. 28, 1989, Ser. No. 329,444

Int. Cl.[5] E02F *3/815*

U.S. Cl. 172—305 **9 Claims**

1. An adjustable blade apparatus for use with an earth moving vehicle, such as a bulldozer or the like, comprising:

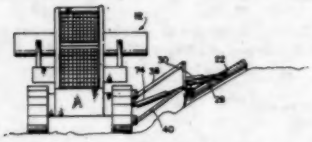
a support assembly, including a connecting frame member, supported relative to the vehicle such that the connecting

frame is movable as a unit in a single vertical plane when the vehicle is in a horizontal position;

an earth moving blade movably secured to the connecting frame;

means independent of the earth moving blade for moving the connecting frame in said vertical plane without changing the orientation, other than the vertical position, of the earth moving blade secured thereto;

means independent of the connecting frame moving means for moving the earth moving blade relative to the connecting frame, wherein said blade moving means includes means for moving the blade in a first plane relative to the connecting frame member and a second plane which is at right angles to the first plane, wherein the blade is rotatably connected in the vicinity of one end thereof to the



connecting frame member and wherein said means for moving the blade in a first plane includes a first hydraulic cylinder connected between the connecting frame member at a point substantially removed from the rotatable connection of the blade element and the blade at a selected point substantially removed from the one end thereof, and wherein the blade is pivotably connected in the vicinity of said one end thereof to the connecting frame member in the immediate vicinity of the rotatable connection thereof, and wherein the means for moving the blade in a second plane includes a second hydraulic cylinder connected between the connecting frame member in the vicinity of the pivotable connection of the blade and thereto and the blade at a point substantially removed from the one end thereof.

4,953,626

RAM BORING MACHINE HAVING A PULL-AND-TURN REVERSING GEAR

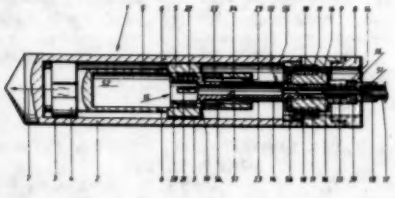
Franz-Josef Püttmann, and Alfons Hesse, both of Lennestadt, Fed. Rep. of Germany, assignors to Paul Schmidt, Lennestadt, Fed. Rep. of Germany

Filed Feb. 2, 1989, Ser. No. 306,033

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807831

Int. Cl.[5] B25D *9/00*

U.S. Cl. 173—91 **14 Claims**



1. A ram boring machine, comprising: a tubular housing; a striking piston axially displaceable in said tubular housing and having radial control apertures; a control pipe (15) rotatably supported in said tubular housing so as to travel beyond the radial control apertures in said striking piston to control forward and return motion of said striking piston, said control pipe being made up of at least two parts including a rear part (16), viewed in the striking direction, and a front part (19), and having control apertures corresponding to those of said piston, said piston having an overtravel with respect to said control pipe; a pressure medium supply hose connected to said rear part of said control pipe; a bearing pipe (14) having control apertures (22) and being arranged in said housing so as to support said control pipe; an axially unlockable locking device actable upon by a force and provided so as to connect said rear part of said control pipe to said bearing pipe and so as to relieve said rear part from an operational pressure, said locking device being unlockable by a pull at said supply hose counter to the acting force, said rear part allowing a reversal of striking direction of said striking piston without interruption of the pressure medium; and securing means for fixing said front part to said bearing pipe so that said front part is arranged so as to completely carry the operational pressure.

4,953,627

CERAMIC HEAT EXCHANGERS AND PRODUCTION THEREOF

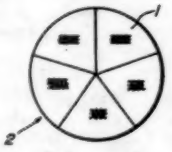
Toshikazu Ito, Komaki; Takashi Harada, Nagoya, and Toshiyuki Hamanaka, Suzuka, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 20, 1989, Ser. No. 409,947

Claims priority, application Japan, Sep. 29, 1988, 63-242543

Int. Cl.[5] F28D *19/00*

U.S. Cl. 165—8 **2 Claims**



1. A ceramic heat transmission type or regenerative heat exchanger comprising a plurality of matrix segments, said matrix segments being bonded together with a bonding material, wherein a difference in coefficient of thermal expansion between the matrix segments and the bonding material is not more than 0.02% at 800° C. and a Young's modulus of the bonding material is not less than 0.4 times to not more than 1.8 times that of the matrix segments.

4,953,628

LATENT HEAT STORAGE APPARATUS

Kazuo Yamashita, Ikoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 62,650, Jun. 16, 1987, Pat. No. 4,817,704. This application Aug. 22, 1988, Ser. No. 234,777

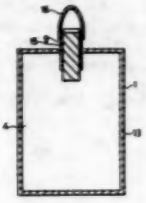
Claims priority, application Japan, Jun. 17, 1986, 61-140757; Jul. 30, 1986, 61-179074; Oct. 20, 1986, 61-248724

Int. Cl.[5] F28D *20/00*

U.S. Cl. 165—10 **2 Claims**

1. A heat storage apparatus comprising a receptacle filled with a heat storage material for allowing supercooling and discharging latent heat by a phase change from liquid to solid in response to stimulation, said receptacle being provided with a port, a capillary member to be stimulated being tightly fitted in said port and having a portion thereof embedded in said heat storage material, and said port being covered with a removable

cap for preventing said capillary member from being exposed to the outside air and from being accidentally stimulated,



wherein, for obtaining heat, said removable cap is removed from the receptacle and said capillary member is stimulated.

4,953,629

PACK OF HEAT TRANSFER PLATES

Kurt Karlsson, Tyresö, and Birger Pettersson, Värmdö, both of Sweden, assignors to Svenska Rotor Maskiner AB, Stockholm, Sweden

PCT No. PCT/SE88/00083, § 371 Date Aug. 4, 1989, § 102(e) Date Aug. 4, 1989, PCT Pub. No. WO88/06709, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 25, 1988, Ser. No. 382,650

Claims priority, application Sweden, Feb. 27, 1987, 8700856

Int. Cl.[5] F28D *19/04, 17/02*

U.S. Cl. 165—10 **2 Claims**

1. In a pack of heat transfer plates for heat exchangers, comprising:

a plurality of mutually identical profiled plates (2,3) which are arranged in mutually contiguous relationship and which form channels for passage of a heat exchanging media, said channels extending between two mutually opposing end surfaces (4,5) of the pack (1), and in which each plate in the pack (1) has provided thereon corrugations in the form of mutually parallel S-shaped double ridges (21,22;31,32) which project symmetrically and obliquely from both opposite sides of each said plate;

said plates (2,3) being oriented such that the double ridges of one plate intersect the double ridges of an adjacent plate, and said adjacent plates being in contact with one another solely at points of intersection (24) of said intersecting double ridges and;

said double ridges of respective plates extending symmetrically and obliquely in mutually opposite directions relative to main flow directions (6) of the heat exchanging media flowing in the channels formed between adjacent plates;

the improvement wherein:

said plates (2,3) are mutually oriented such that each pair of double ridges which, as viewed in the main directions (6) of the flows of heat exchanging media, converge towards a point of intersection (24) presents a part (21) of the double ridge of one plate (2) which projects into an intermediate channel, and also a part (32) of the double ridge of the other plate (3) which projects away from said intermediate channel, so as to provide substantially equal flow of said heat exchanging media between all plates of said pack independent of the flow direction of the heat exchanging media.

4,953,630

APPARATUS FOR CONTROLLING AN AUTOMOBILE AIR-CONDITIONER TO CONTROL DEFROST BLEED AIR

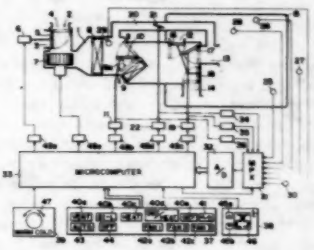
Katsumi Iida, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,391

Claims priority, application Japan, Sep. 27, 1988, 63-241261

Int. Cl.[5] F25B *29/00;* **B60H** *3/00*

U.S. Cl. 165—17 **3 Claims**



1. An apparatus for controlling air-conditioning of a motor vehicle comprising:

(a) a duct defining an air flow passageway and having a defroster outlet, a vent outlet, and a heat outlet, each of said outlets opening to a compartment of the motor vehicle to allow air to be blown off from said duct into said vehicle compartment;

(b) a heater core disposed in said air flow passageway of said duct, at a position biased toward one end of said air flow passageway, for heating air passing said heater core;

(c) an air-mix door disposed in said duct upstream of said heater core for regulating an amount of air passing through said heater core and an amount of air bypassing said heater core;

(d) an evaporator disposed in said duct upstream of said heater core for cooling air passing said evaporator;

(e) at least one mode door disposed in said duct for opening and closing said outlets selectively;

(f) air-mix door opening calculation means for calculating the amount of opening of said air-mix door based on at least a vehicle compartment temperature and a setting temperature;

(g) blown-off air temperature calculation means for calculating the temperature of air blown off into the vehicle compartment based on the amount of opening of said air-mix door and the cooling temperature of said evaporator;

(h) defrosting-air bleeding determination means for determining the amount of air bleeding from said defroster outlet, based on at least an outside temperature and the calculated amount of opening of said air-mix door, when the blown-off air temperature calculated by said blown-off air temperature calculation means is higher than a predetermined temperature; and

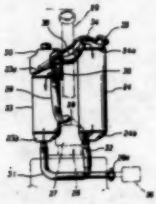
(i) drive and control means for driving and controlling said mode door in such a manner that the amount of air bleeding from said defroster outlet is equal to an amount determined by said defrosting-air bleeding determination means.

4,953,631

RADIATOR DEVICE OF MOTORCYCLE

Fumikazu Kimura, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 27, 1989, Ser. No. 457,446
Claims priority, application Japan, Jan. 24, 1989, 1-13125
Int. Cl.[5] F01P 11/02; B60K 11/04
U.S. Cl. 165—41 9 Claims



1. A radiator device for a motorcycle of the type operatively connected to an engine unit provided with a water jacket and within which cooling liquid circulates, comprising:

a pair of first and second upstanding radiator units arranged in a laterally spaced fashion with respect to a body portion of said motorcycle, each of said radiator units being composed of upper and lower tanks disposed in an upright arrangement thereof, the upper tank of said first radiator unit having a top portion thereof disposed at a level which is lower than a top portion of the upper tank of said second radiator unit when said motorcycle is disposed in a normal vertically upright positional mode;

a first water tube means connecting said upper tank of said first radiator unit and said water jacket of said engine unit;

a second water tube means interconnecting said upper tanks of said first and second radiator units; and

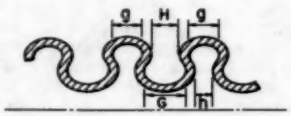
tube means connected to said lower tanks of said first and second radiator units for combining cooling water flows from said lower tanks of said first and second radiator units into one cooling water flow.

4,953,632

HEAT PIPE AND METHOD OF MANUFACTURING THE SAME

Masuji Sakaya, Narashino; Ryuichi Okiai, Yotsukaido; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Division of Ser. No. 282,025, Dec. 7, 1988. This application Jun. 13, 1989, Ser. No. 365,531
Claims priority, application Japan, Dec. 9, 1987, 62-309669; Apr. 27, 1988, 63-102422; Apr. 27, 1988, 63-102423; Apr. 27, 1988, 63-102424
Int. Cl.[5] F28D 15/02
U.S. Cl. 165—104.26 1 Claim



1. A heat pipe comprising:

a pipe formed by welding mating edges of a metal tape;

a wick layer on an inner surface of said pipe; and

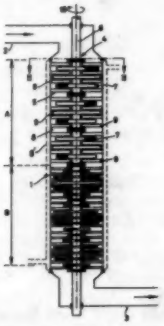
Ω-shaped grooves in which a length of a wave of an outer projecting portion is larger than that of an inner recessed portion, formed on an outer surface of said pipe in a radial direction thereof.

4,953,633

APPARATUS FOR KEEPING AT A DETERMINED TEMPERATURE A PRODUCT MIXTURE CONSISTING OF A LIQUID CONTAINING SOLID PIECES

Willem F. Hermans, Amstelveen, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands

Filed Nov. 2, 1989, Ser. No. 430,817
Claims priority, application Netherlands, Nov. 3, 1988, 8802697
Int. Cl.[5] F28F 13/12
U.S. Cl. 165—109.1 11 Claims



1. Apparatus for keeping at a determined temperature, for a determined time, a product mixture flowing therethrough and consisting of a liquid of low to medium viscosity containing solid pieces, which comprises a cylindrical vessel provided at one end with an inlet and at the other end with an outlet for the mixture, a conveyor mechanism acting selectively on the solid pieces in the mixture being disposed in the vessel, whereby the speed at which the solid pieces are conveyed through the vessel can be adjusted irrespective of the rate of flow of the liquid through the vessel, said conveyor mechanism having a rotor in the form of a shaft coaxially rotatable in the vessel and provided with at least one series of rotor arms on the shaft, extending radially and lying substantially next to one another and spaced apart in the axial direction, the ends of said arms reaching to a point close to the inner wall of the vessel, and also having a stator in the form of at least one series of stator arms extending radially inwards from the wall of the vessel and lying substantially next to one another and spaced apart in the axial direction, said stator arms extending between the rotor arms and reaching to a point close to the rotor shaft, and the mutual distance between the rotor arms and the mutual distance between the stator arms, in the axial direction, varying from the inlet to the outlet, the variation occurring mainly in one direction, while in the case both of the rotor arms and of the stator arms a radially extending side edge of an arm is, viewed in the axial direction of the rotor and the stator, adjacent to or situated within the periphery of a following arm, so that a solid piece moving through the vessel can pass through between two neighbouring arms only transversely to the axial direction of the vessel.

4,953,634

LOW PRESSURE HIGH HEAT TRANSFER FLUID HEAT EXCHANGER

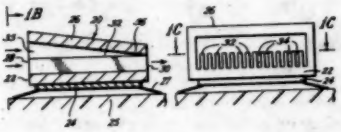
Richard D. Nelson, and Dennis J. Herrell, both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Apr. 20, 1989, Ser. No. 341,006
Int. Cl.[5] F28F 13/08
U.S. Cl. 165—147 12 Claims

1. A fluid heat exchanger for cooling an electronic component comprising,

a housing for receiving heat from an electronic component,
said housing having a fluid inlet and a fluid outlet at opposite ends of the housing,
the cross-sectional area perpendicular to the direction of fluid flow in the housing for conveying fluid from the inlet to the outlet decreasing from the inlet to the outlet,
the housing includes a top and a wall, said wall adapted to be positioned adjacent said electronic component in a heat conducting relationship,
a plurality of fins, separated by channels, positioned in the housing and connected to the wall, and
said top of the housing is spaced from the fins.

12. A fluid heat exchanger for cooling an electronic component comprising,



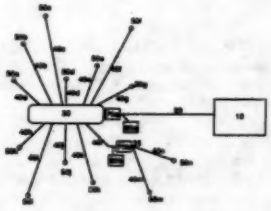
a housing having a base for receiving heat from an electronic component, a top, first and second opposing ends, a fluid inlet at the first end and a fluid outlet at the second end,
a plurality of spaced fins, said fins including a top and a bottom, said bottom being connected to the base and extending from the inlet to the outlet,
said top of the housing positioned in a non-parallel relationship relative to the tops of the fins, said housing top being closer to the fins at the fluid outlet than at the fluid inlet providing a cross-sectional area in the housing for conveying fluid from the inlet to the outlet decreasing from the inlet to the outlet.

4,953,635

METHOD FOR IMPROVING THE STEAM SPLITS IN A MULTIPLE STEAM INJECTION PROCESS

George R. Stowe, III, Bakersfield, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 27, 1989, Ser. No. 386,525
Int. Cl.[5] E21B 36/00, 43/24
U.S. Cl. 166—303 6 Claims



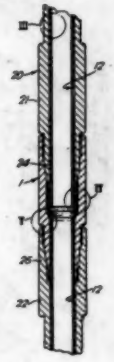
1. A method for enhancing the uniformity of steam distribution in a multiple steam injection system comprising a steam generator, a steam header, a primary steam line connecting the generator to the header, and a plurality of secondary steam lines connecting the header to a plurality of steam injection wells, the method comprising:
(a) injecting a surfactant into the primary steam line, and
(b) mixing the surfactant and steam sufficiently so that the surfactant and the steam enter the header as an foam.

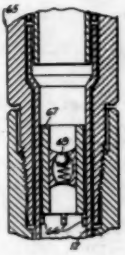
4,953,636

ELECTRICAL CONDUCTOR ARRANGEMENTS FOR PIPE SYSTEM

Frank Mohn, London, England, assignor to Framo Developments (UK) Limited, London, England

Filed Jun. 24, 1988, Ser. No. 210,784
Claims priority, application United Kingdom, Jun. 24, 1987, 8714754
Int. Cl.[5] E21B 17/02, 47/00
U.S. Cl. 166—65.1 25 Claims





1. A pipe assembly comprising:
a pipe member having connector means at each end thereof for connection of the pipe member between cooperating pipe members in a pipestack,
an elongate tubular electrical conductor element having means at each end thereof for electrical connection of the element between cooperating tubular conductor elements, said pipe member and said conductor element being shaped and dimensioned for relative lengthwise movement one within the other, and
a preformed configuration provided on said conductor element and a cooperating preformed configuration on said pipe member engageable by said conductor element configuration, said configuration being so dimensioned that said conductor element is suspended thereby from said pipe member in predetermined concentric and lengthwise relationship therewith when said lengthwise relative movement has brought said configuration into engagement.

4,953,637

APPARATUS FOR RECOVERING GROUND SOIL SAMPLES

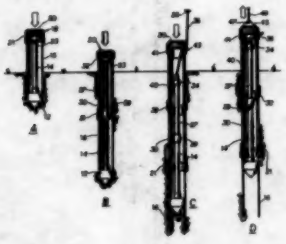
Robert C. Starr, Cambridge, and Robert A. Ingleton, Waterloo, both of Canada, assignors to University of Waterloo, Waterloo, Canada

Filed May 5, 1989, Ser. No. 347,716

Claims priority, application United Kingdom, May 9, 1988, 8810942

Int. Cl.[5] E21B *25/10*

U.S. Cl. 175—20 6 Claims



1. Apparatus for recovering ground soil samples, wherein:
the apparatus includes a piston assembly, comprising a piston and a piston rod;
the piston rod is of solid robust construction, whereby the piston rod is able to transmit downwardly directed drive forces rigidly to the piston;
the apparatus includes a tubular container, in which the piston is sealingly slidable;
the ground soil sample is collected in the tubular container from a ground soil source as a core sample;
the apparatus includes a two-condition drive-transmitting means;
in the first condition, the drive-transmitting means is effective to transmit the drive force acting downwards on the apparatus to the piston assembly;
in the second condition, the drive-transmitting means is effective to transmit said drive force to the container.

4,953,638

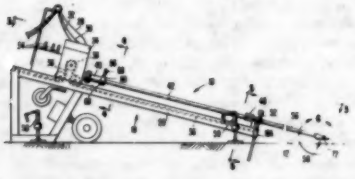
METHOD OF AND APPARATUS FOR DRILLING A HORIZONTAL CONTROLLED BOREHOLE IN THE EARTH

Richard P. Dunn, Wichita Falls, Tex., assignor to The Charles Machine Works, Inc., Perry, Okla.

Filed Jun. 27, 1988, Ser. No. 211,889

Int. Cl.[5] E21B *7/06, 10/00*

U.S. Cl. 175—61 5 Claims



2. A method of forming a borehole in the earth such as for passing under a roadway or the like comprising the steps of:
(1) positioning a boring machine on the surface of the earth adjacent a selected borehole entry point, the machine having means to axially advance and to rotate a drill string made up of a series of lengths of drill pipe, the drill string having a drill bit thereon, the drilling bit having a blade means inclined at an angle to the axis of the drill pipe to which the drill bit is attached;
(2) attaching a clamp means having a pointer thereon to said drill string adjacent said boring machine to indicate the rotational orientation of the drill bit;
(3) simultaneously rotating and advancing the drill string by means of said boring machine in an axial direction inclined to the earth's surface to establish a borehole in the earth generally in the direction of the drill pipe extending from the drilling machine;
(4) adding a new length of drill pipe as necessary to extend the length of the drill string;
(5) maintaining the orientation of said pointer with respect to said drill pipe when said clamp means is transferred from one drill pipe to a successive length of drill pipe by using a liquid bubble level;
(6) reattaching said clamp means to the drill string adjacent said boring machine as each new length of drill pipe is added to the drill string to continue to indicate the rotational orientation of the drill bit;
(7) continue rotating and advancing the drill string to form a borehole until a change in the direction of the borehole is desired;
(8) stopping the rotation of the drill string;
(9) orienting the rotational position of the drill string with the aid of said clamp means so that the drill bit blade is inclined towards the new direction of the borehole desired;
(10) advancing the drill string and thereby the drill bit a short distance without rotation;
(11) resuming simultaneous rotation and advancement of the drill string for a short distance;
(12) sequentially repeating steps (8), (9), (10) and (11) until the direction of the borehole is in the new direction desired;
(13) thereafter simultaneously rotating and advancing the drill string to advance the borehole until another new direction of the borehole is desired and reattaching said clamp means as each new length of drill pipe is added; and
(14) when another change in the direction of the borehole is desired, repeating steps (8), (9), (10) and (11).

4,953,639

CLOSED LOOP HYDRAULIC DRILL FEED SYSTEM

Jeffrey W. Hamner, Allen, and George P. Schivley, Jr., Richardson, both of Tex., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

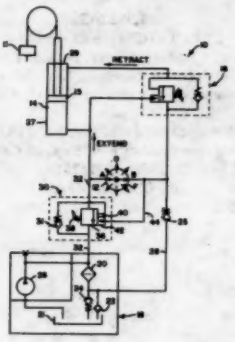
Filed Sep. 8, 1989, Ser. No. 404,601

Int. Cl.[5] E21B *19/08*

U.S. Cl. 175—203 8 Claims

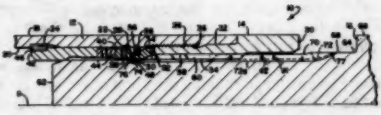
7. A closed loop, drill feed hydraulic system for a rotary drilling apparatus, comprising:
a drill string;
extendible-retractable feed cylinder means for supplying a force to the drill string;
variable, reversible displacement pump means for pumping fluid from either one of first and second ports thereof including pumping fluid to the feed cylinder means;
reservoir means for retaining a supply of fluid for the system;
check valve means for supplying additional fluid to the pump means in response to the feed cylinder means being extended; and
overcenter valve means connected to each of the first and

second ports for controlling flow from the system in response to pressures received from the first and second



ports when the feed cylinder means is extended and retracted.

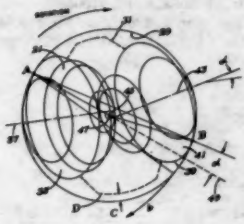
4,953,640
QUICK DETACH BIT
Ewald H. Kurt, 2933 Rosalind Ave., Roanoke, Va. 24014
Filed Aug. 21, 1989, Ser. No. 395,997
Int. Cl.[5] E21B *17/046, 17/06;* F16D *1/10;* F16L *37/00*
U.S. Cl. 175—320 **14 Claims**



1. A quick detach bit apparatus, comprising:
a bit having an outer circumferential surface;
a plurality of alternating, substantially axially extending splines and grooves formed in the surface;
means for accommodating a quick release tool, said means being a tool access groove substantially axially extending along the outer circumferential surface in one of the said splines and grooves, the depth of said tool access groove being greater than the depth of said other grooves, whereby the tool is permitted to be moved axially along the tool access groove.

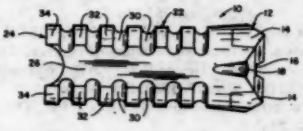
4,953,641
TWO CONE BIT WITH NON-OPPOSITE CONES
Rudolf C. O. Pessier, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.
Filed Apr. 27, 1989, Ser. No. 344,134
Int. Cl.[5] E21B *10/08*
U.S. Cl. 175—353 **6 Claims**

3. An improved earth boring bit comprising:
a body composed of two section;
a cantilevered bearing shaft with an axis extending inwardly and downwardly on each section;
a rotatable, generally conical cutter on each bearing shaft, said cutter having a conical gauge surface to engage and define a borehole with a wall of selected gauge diameter;
a pressure compensating and lubrication means in each section;
the axis of one cutter being skewed relative to the other to cause the conical gauge surfaces of the two cones to engage the wall of the hole at points that are other than 180 degrees apart;



a line through said points being separated from a line from one of said point through the center of the bit by an angle not greater than about 13 degrees.

4,953,642
ROCK DRILL BIT
Roger D. Skaggs, 323 Church St., Bonne Terre, Mo. 63628
Filed Mar. 20, 1989, Ser. No. 326,079
Int. Cl.[5] E21B *10/44, 10/60*
U.S. Cl. 175—393 **13 Claims**



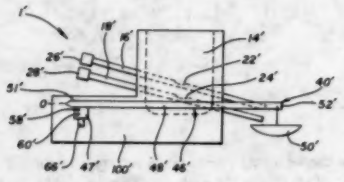
1. A rock drill bit comprising an elongated body of tubular cross section rotatable about an axis and having a head end portion closing one end of the body which head end portion engages a drill face to be drilled, said body having an outer surface and an opposite trailing end portion having an opening for receiving a drill rod, the largest transverse dimension of the body being substantially smaller than the length thereof, the head end portion having portions formed or relatively hard material for engaging and drilling the drill face when the bit is rotated, means including at least one opening through the head end portion for drilling fluid to pass to the area around the head end portion, at least two circumferentially spaced axially extending cutouts formed in the outer surface of the bit body forming passages along sustantially the length of the bit body with the surface of a bore being drilled through which drilling fluid and cuttings removed during drilling can pass as it moves away from the drill face, elongated outwardly extending body portions extending along substantially the length of the body between the cutouts and from the head end portion to the trailing end portion and defining the reawardmost points of the drill bit, the outwardly extending body portions having a plurality of axially spaced circumferentially extending grooves dividing the outwardly extending body portions into a plurality of outwardly extending elements, rotation of the bit in a bore causing the elements to rotate in closely spaced relationship to the surface of the bore whereby drilling fluid and cuttings moving along the body in the passages will be swirled and further pulverized by the elements as the bit rotates in the bore, rotation of the head end portion of the bit producing a bore diameter that is somewhat greater than the diameter of rotation of the outwardly extending elements.

4,953,643

POWDER DISPENSING AND MEASURING DEVICE

Dolores D. Ellion, and M. Edmund Ellion, both of 2152 Highland Oaks Dr., Arcadia, Calif. 91006

Filed Mar. 6, 1989, Ser. No. 318,963
Int. Cl.[5] G01G 13/02; B65G 69/06
U.S. Cl. 177—123 2 Claims



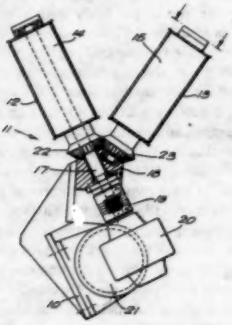
1. An improved powder dispensing apparatus comprising:
barrel means for transferring powder from a first retainer to a second retainer, said barrel means including first and second barrels mounted at first and second angles for fast and slow transfer of powder from said first retainer to said second retainer;
vibrating means for inducing vibration in said barrel effective to cause said powder to translate on a surface thereof; and
control means for controlling the activation of said vibrating means.

4,953,644

STABILIZING AND WEIGHING DEVICE

Rune Akesson, Hyllinge, and Giuliano Pegoraro, Bjuv, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Nov. 29, 1989, Ser. No. 442,944
Claims priority, application European Pat. Off., Dec. 17, 1988, 88121200.5
Int. Cl.[5] G01G 19/00; B65G 15/14
U.S. Cl. 177—145 8 Claims



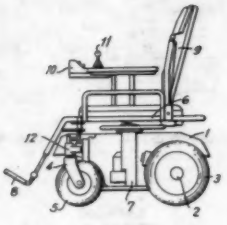
1. A device for stabilising and weighing articles of irregular shapes and sizes which comprises a weighing machine and two upstream to downstream successive pairs of adjacent parallel conveyors, wherein each pair of conveyors have parallel upper surfaces having adjacent parallel longitudinal edges for transporting the articles and wherein the upper surfaces of the two conveyors of each pair of conveyors are inclined to one another at their adjacent longitudinal edges so that the upper surfaces form an acute angle, the upstream pair of conveyors providing a unit for stabilising the articles transported and the downstream pair of conveyors providing a load-bearing platform for the weighing machine to form a weighing unit for weighing the articles transported.

4,953,645

ELECTRIC WHEEL-CHAIR

Hans W. Körber; Reinhard Köster, both of Kiel; Ewald Linse, Heikendorf, and Dieter Simmat, Kiel, all of Fed. Rep. of Germany, assignors to Ortopedia GmbH, Kiel, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,530
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800649; Sep. 21, 1988, 3832125
Int. Cl.[5] A61G 5/04
U.S. Cl. 180—6.5 17 Claims



1. An electric wheel-chair comprising:
a chassis;
a first axle having drive wheels, which is connected to the chassis;
a pair of second axles which are connected to the chassis, each having a swivel wheel that is pivotable about an axis perpendicular to movement direction of the wheel-chair, so that the swivel wheels change steering radius in response to change in running direction of the wheel-chair;
an actuator independently coupled to each swivel wheel for steering the wheel in response to steering control signals;
a seat assembly mounted on the chassis;
a drive unit coupled to each drive wheel for driving the wheel in response to maneuvering control signals indicative of desired wheel-chair maneuvers to be executed by the drive unit;
an operating unit coupled to the drive units and the actuators for causing generation of the control signals; and
means for selectively disengaging coupling of at least one of the swivel wheels from the actuator.

4,953,646

ELECTRONIC DRIVE PROPULSION DEVICE FOR MOTOR VEHICLES

Chang H. Kim, Hyaesong Yonrip Na-Dong, Room 205, 551-9, Shinwol-Dong, Kwanak-ku, Seoul, Rep. of Korea

Continuation of Ser. No. 81,093, Aug. 3, 1987, abandoned. This application May 5, 1989, Ser. No. 348,134
Claims priority, application Rep. of Korea, May 8, 1986, 11729
Int. Cl.[5] B60K 1/02
U.S. Cl. 180—65.4 3 Claims

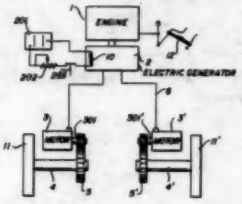
1. An electric drive propulsion system for a motor vehicle comprising:
a vehicle having an engine for providing propulsion power thereto, including a vehicle engine accelerator, wherein rotational speed of said engine is controlled exclusively by said vehicle engine accelerator;
an electric generator connected to said engine to be driven thereby, said generator including an exciting coil for causing electric energy to be generated upon excitation thereof, the exciting coil being connected for excitation to a source of DC current through a preset electric resistance

adjusting device, such that electric energy output of said generator varies solely with variations of said engine rotational speed;

at least one electric motor mounted on said vehicle and coupled with an axle thereof to drive the axle to provide propulsion for said vehicle, said at least one electric motor being directly connected to said generator by an electric circuit having no intermediate control devices so as to be driven solely by the entire electric energy generated thereby;

said vehicle being provided with a brake and a brake pedal for operating said brake;

a pair of normally closed contact terminals of a power switch connected in said generator excitation circuit between said exciting coil and said source of DC current,



said power switch being operated by said brake pedal to open said contact terminals upon application of pressure to said brake pedal and to close said contact terminals upon release of said brake pedal, operation of said brake pedal thereby causing discontinuation of vehicle propulsion and release of said brake pedal causing continuation of propulsion;

such that said at least one electric motor is connected to receive the entire output of electric energy generated by said electric generator as the sole source of energy for propulsion of said vehicle so as to increase and decrease speed of said at least one electric motor both in accordance with increase and decrease of speed of said engine as controlled by said vehicle engine accelerator and continuation and discontinuation of vehicle propulsion as caused by operation of said brake pedal.

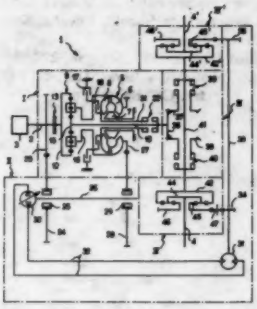
4,953,647

TRANSMISSION SYSTEMS FOR HIGH-SPEED TRACK-LAYING VEHICLES OR VEHICLES WITH NON-STEERABLE WHEELS

Pierre Leboime, Paris, France, assignor to Zone Industrielle d'Epluches, Saint-Ouen-l'Aumone, France

Filed Sep. 13, 1989, Ser. No. 406,718
Claims priority, application France, Sep. 14, 1988, 88 11967
Int. Cl.[5] B62D *11/12*; F16H *47/08*
U.S. Cl. 180—9.1 **10 Claims**

1. Transmission for high-speed track-laying vehicles or vehicles with non-steerable wheels having an engine adapted to produce substantially constant power over a wide range of speeds, said transmission comprising a gearbox equipped with a hydrodynamic torque converter, said hydrodynamic torque converter having a primary (pump) and a secondary (turbine) and functioning in a power splitting arrangement, an output shaft of said gearbox, steering means adapted to procure continuous variation of the turning radius, and a reversing gearing associated with epicyclic output gears, and further comprising a positive clutch coupling the secondary of said hydrodynamic torque converter to said gearbox output shaft, together with two freewheel clutches driving the said steering means, one of said freewheel clutches being driven by the vehicle engine whereas the other one is driven by the primary of said hydro-



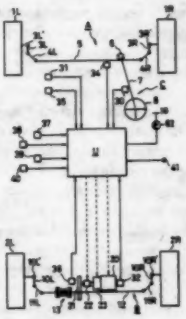
dynamic converter, whereby the highest drive speed is selected at all times.

4,953,648

REAR WHEEL STEERING APPARATUS

Hiroshi Ohmura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 335,355, Apr. 10, 1989, abandoned.
This application Feb. 1, 1990, Ser. No. 472,403
Claims priority, application Japan, Apr. 8, 1988, 63-85371
Int. Cl.[5] B62D *5/04*
U.S. Cl. 180—79.1 **27 Claims**



1. A rear wheel steering apparatus comprising:

a rear wheel steering mechanism for steering rear wheels;

a neutral holding means for holding the rear wheel steering mechanism always at a neutral position, which is connected to the rear wheel steering mechanism;

a motor as a driving source connected to the rear wheel steering mechanism and arranged for displacing the rear wheel steering mechanism in resistance to the neutral holding means;

a clutch being interposed between the rear wheel steering mechanism and the motor and arranged for connecting or disconnecting the rear wheel steering mechanism to or from the motor;

a start detecting means for detecting the turning of an ignition switch on; and

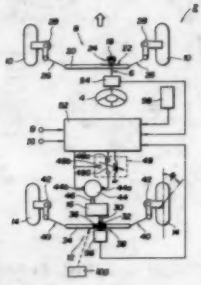
an initial check means for carrying out an initial check of a drive control system of the motor to determine the absence or presence of any abnormality therein including the motor by disconnecting the clutch when the start detecting means detects that the ignition switch is turned on.

4,953,649

FOUR-WHEEL STEERING DEVICE FOR AN AUTOMOBILE

Yoshikazu Kawai; Chosuke Sato, and Masaru Kato, all of Shizuoka, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 2, 1988, Ser. No. 279,557
Claims priority, application Japan, Dec. 10, 1987, 62-310946
Int. Cl.[5] B62D 5/06
U.S. Cl. 180—79.1 **3 Claims**



1. A four-wheel steering device for an automobile comprising main turning means for steering main steered wheels, subsidiary turning means for steering subsidiary steered wheels, neutral position biasing means for yieldably urging the subsidiary steered wheels to a neutral position having a steering angle of zero, and a control system including a motor having terminals, first steering angle sensor means for main steered wheels for detecting a first steering angle of the main steered wheels, second steering angle sensor means for subsidiary steered wheels for detecting a second steering angle of the subsidiary steered wheels, and control means responsive to a state change of the first and second detected steering angles for judging an operating state of the control system, said control means being operable when said control system operates normally for driving and controlling the motor and thereby the subsidiary turning means so as to steer the subsidiary steered wheels depending on the steering angle of the main steered wheels, said control means being further operable when said control system operates abnormally for cutting off the power source to the motor in order to converge, by the urging of the neutral position biasing means, the steering angle of the subsidiary steered wheels gradually to zero and to also short-circuit the terminals of the motor.

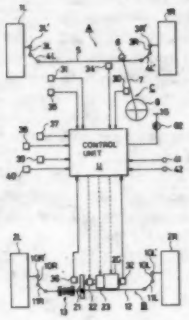
4,953,650

REAR WHEEL STEERING CONTROL SYSTEM

Hiroshi Ohmura, Higashi-Hiroshima, Japan, assignor to Mazda Motor Company, Hiroshima, Japan

Filed Mar. 13, 1989, Ser. No. 322,502
Claims priority, application Japan, Mar. 14, 1988, 63-58251
Int. Cl.[5] B62D 7/14, 5/04
U.S. Cl. 180—79.1 **15 Claims**

1. A rear wheel steering control system comprising a rear wheel steering mechanism for steering rear wheels of a vehicle, drive motor means connected with said rear wheel steering mechanism for actuating the same, target setting means for setting a target steering angle of the rear wheels in accordance with a predetermined factor, motor control means for controlling said drive motor means so as to accomplish the target steering angle of the rear wheels, magnetic brake means for preventing the rear wheel steering mechanism from any steering movement when the target steering angle of the rear wheels is substantially constant, release means for releasing the magnetic brake means to allow the steering movement of the rear wheel steering mechanism under a predetermined condition even when the target steering angle of the rear wheels is substantially constant.

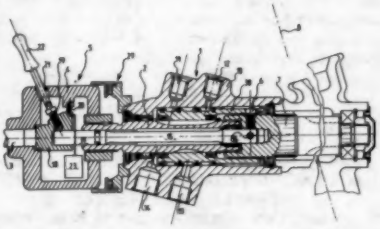


4,953,651

COUPLING ARRANGEMENT IN POWER STEERING FOR VEHICLES

Emmanuel Lescaut, Les Clayes Sous Bois, France, assignor to Automobiles Peugeot and Automobile Citroen, both of, France, a part interest

Filed Jul. 21, 1987, Ser. No. 76,023
Claims priority, application France, Jul. 25, 1986, 86 10851
Int. Cl.[5] B62D 5/09
U.S. Cl. 180—132 **7 Claims**



1. A power-assisted steering device for an automotive vehicle, comprising

a power-assisted steering valve having a rotor rotatively coupled to a steering shaft of the vehicle,

a stationary body comprising a box including said rotor,

a tubular sleeve located within the box, coaxially surrounding said rotor and rotatively coupled to a steering mechanism operating member,

a connecting rod coaxially located within said valve and having an end located within said valve which is rotatively coupled to said operating member and an opposite end, and

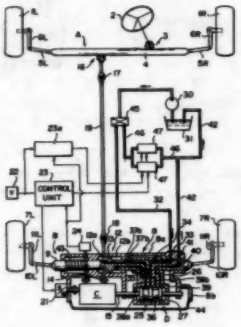
a resilient coupling means interconnecting said steering shaft and said opposite end of said connecting rod for allowing said steering shaft to resiliently rotate with respect so said connecting rod.

4,953,652

FOUR-WHEEL STEERING SYSTEM FOR MOTOR VEHICLE

Hiroshi Ohmura, Higashihiroshima; Takashi Nakashima, Hiroshima, and Takeshi Murai, Hatsukaichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 29, 1988, Ser. No. 187,920
Claims priority, application Japan, May 1, 1987, 62-106261
Int. Cl.[5] B62D 5/04
U.S. Cl. 180—140 25 Claims



1. A four-wheel steering system for motor vehicle including

a front wheel steering mechanism for steering front wheels in response to an operation of a steering wheel,

a rear wheel steering mechanism for steering rear wheels in accordance with the steered movement of the front wheels,

control means having driving condition detecting means for detecting a vehicle driving condition and controlling the rear wheel steering mechanism in accordance with the vehicle driving condition,

fail judging means for judging of a failure of the control means and producing a failure signal denoting the failure, and

fail-safe means for receiving the failure signal from the fail judging means and controlling the rear wheel steering mechanism independently from the control means when the control means is in an unusual condition, wherein

the fail judging means being provided with first fail judging means and second fail judging means adapted to be actuated independently for judging different fail conditions,

the control means being provided with a control unit for receiving signals from said driving condition detecting means and producing control signals to the rear wheel steering mechanism,

the first fail judging means being provided in the control unit, and

the second fail judging means being provided in a back up control unit independent from the control unit.

4,953,653

FLUID POWER ASSIST RACK AND PINION STEERING GEAR WITH END-TAKE-OFF

Edwin G. Klosterhaus, Livonia, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Jan. 17, 1989, Ser. No. 297,761
Int. Cl.[5] B62D 5/06
U.S. Cl. 180—148 3 Claims

2. A fluid power assist steering gear for steering a pair of steerable wheels of a vehicle, said steering gear comprising:

a housing attachable to the vehicle;

a rack member movable in said housing, said rack member having first and second axially opposite ends connectable with a respective one of a pair of ball joints associated with said steerable wheels;

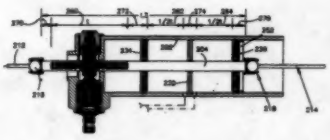
a plurality of rack teeth formed in a row on said rack member at a first axial section of said rack member corresponding in length with said row of rack teeth;

a rotatable pinion gear in meshing engagement with said rack teeth;

a hydraulic motor for moving said rack member to provide steering power assist, said hydraulic motor comprising:

a piston fixed to said housing and having an axial passage through which said rack member moves; and

first and second end wall members fixed to said rack member on opposite axial sides of said piston and movable with said rack member when pressurized fluid is directed into a space between said piston and one of said end wall members, said first end wall member corresponding in length with a second axial section of said rack member, said second end wall member corresponding in length with a third axial section of said rack member;



a bearing fixed to said rack member and supporting said rack member for reciprocating movement in said housing and in a path having a predetermined length, said bearing corresponding in length with a fourth axial section of said rack member;

said first axial section of said rack member being adjacent to said first end of said rack member;

said second axial section of said rack member being adjacent to said first axial section;

said fourth axial section of said rack member being contiguous to said third axial section;

said second end of said rack member being contiguous to said fourth axial section; and

said rack member having a position centered on said path of movement, said second end of said rack member being receivable within said housing to locate the respective ball joint within said housing when said rack member is in said centered position.

4,953,654

VEHICULAR DIFFERENTIAL LIMITING TORQUE CONTROL SYSTEM

Takashi Imaseki, and Yuji Kobari, both of Zushi, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 13, 1988, Ser. No. 256,518
Claims priority, application Japan, Oct. 14, 1987, 62-259038; Dec. 10, 1987, 62-312489
Int. Cl.[5] B60K 23/04, 31/00
U.S. Cl. 180—197 12 Claims

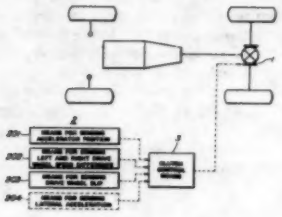
1. A differential limiting torque control system for a vehicle, comprising:

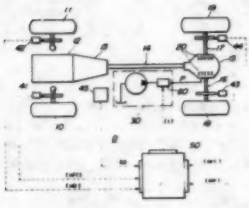
differential limiting clutch means provided between left and right drive wheels of the vehicle for varying an actual differential limiting torque in response to a control signal,

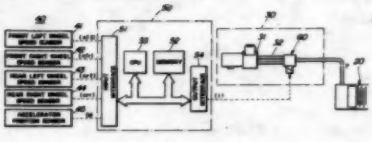
sensor means comprising first sensing means for sensing a throttle opening degree of the vehicle, second sensing means for sensing a left and right drive wheel speed difference, and third sensing means for sensing a drive wheel slip, and

control means for producing said control signal to control said actual differential limiting torque in accordance with signals sent from said sensor means, said control means comprising first function generating means connected

with said second sensing means for producing a first limiting torque signal representing a first differential limiting torque which increases as said left and right drive wheel speed difference increases, second function generating means connected with said first sensing means for producing a second limiting torque signal representing a second differential limiting torque which increases as said throttle opening degree increases, third function generating means connected with said third sensing means for producing a







third limiting torque signal representing a third differential limiting torque which increases as said drive wheel slip increases, and summing means connected with said first, second and third function generating means for producing said control signal representing a final desired differential limiting torque which is equal to a remainder resulting from subtraction of said third differential limiting torque from a sum of said first and second differential limiting torques.

4,953,655

ACOUSTIC APPARATUS

Kazunari Furukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 30, 1989, Ser. No. 330,457

Claims priority, application Japan, Apr. 4, 1988, 63-81344; Apr. 4, 1988, 63-81345

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—160 **11 Claims**

1. An acoustic apparatus, comprising:

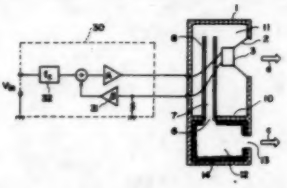
a first enclosure defining a first chamber;

a second enclosure defining a second chamber;

a duct for causing the first and second chambers to communicate with each other, the duct constituting a Helmholtz resonator together with the first enclosure;

a vibrator mounted to the first enclosure, the vibrator having an inner surface which faces inside the first enclosure and an opposing outer surface, the vibrator directly externally radiating an acoustic wave from the outer surface and driving the Helmholtz resonator by the inner surface;

an opening formed in the second enclosure and constituting a low-pass type acoustic filter together with the second



enclosure, the acoustic filter having a cutoff frequency which is set to be higher than a resonance frequency of the Helmholtz resonator and to be lower than an open duct resonance frequency of the duct; and

a vibrator driver for driving the vibrator to cancel an air counteraction from the resonator when the Helmholtz resonator is driven.

4,953,656

OFFSET DRIVE FOR BALLOON TIRED MOTORCYCLE

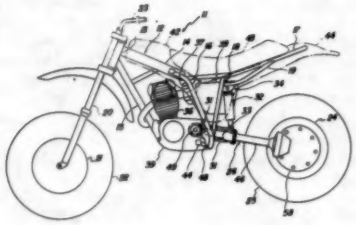
Hiroshi Kondo, Iwata, and Tadao Okada, Fukuroi, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 28, 1986, Ser. No. 834,607

Claims priority, application Japan, Mar. 4, 1985, 60-41206

Int. Cl.[5] B62M *7/02*

U.S. Cl. 180—226 **5 Claims**



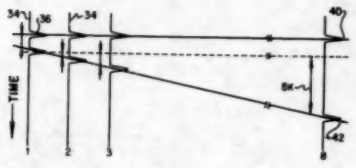
1. In a motorcycle having a frame means, a dirigible front wheel supported by said frame means, power means supported by said frame means and driving an output shaft, a rear wheel supported by said frame means a low pressure balloon tire mounted upon said rear wheel, said rear wheel and mounted tire having a width at least equal to the width of said frame means, the improvement comprising means for driving said rear wheel from said output shaft comprising a driven ring gear affixed for rotation with said rear wheel and having its teeth disposed at least in substantial part laterally inwardly from the outer periphery of said rear wheel, and a pinion gear driven from said engine output shaft and in mesh with said ring gear.

4,953,657

TIME DELAY SOURCE CODING

Bruce L. Edington, Houston, Tex., assignor to Halliburton Geophysical Services, Inc., Houston, Tex.

Continuation of Ser. No. 126,346, Nov. 30, 1987, abandoned.
This application Feb. 14, 1989, Ser. No. 312,360
Int. Cl.[5] G01V 1/00
U.S. Cl. 181—111 10 Claims



6. A method of obtaining seismic data for a geophysical survey, said method comprising the steps of:

activating a first seismic energy source having a selected frequency component;

receiving seismic signals from said first seismic energy source at at least one point within said geophysical survey;

activating a second seismic energy source after a first selected time delay from activation of said first seismic energy source and while said seismic signals from said first seismic energy source are being received, said first selected time delay being a non-integral multiple of the period of said selected frequency component;

receiving seismic signals from said second seismic energy source at said at least one point within said geophysical survey;

activating said first seismic energy source a second time;

receiving seismic signals from said second activation of said first seismic energy source at said at least one point within said geophysical survey;

activating said second seismic energy source after a second selected time delay from said second activation of said first seismic energy source and while said seismic signals from said second activation of said first seismic energy source are being received;

recording, as a function of time, the amplitudes of the seismic signals received at said at least one point within said geophysical survey for each activation of said first and second seismic energy source;

summing the amplitudes of the received seismic signals from each activation as a function of time;

utilizing said selected time delays to time shift the received seismic signals from each activation so that the signals received from said second source are received at the same times for each activation;

summing the amplitudes of said time shifted seismic signals as a function of time;

utilizing said selected time delays to derive an appropriate time domain operator for each summation;

deriving the Fourier transform to the frequency domain of each time domain operator;

deriving the Fourier transform to the frequency domain of each summation;

calculating the signals received from each seismic energy source in the frequency domain for each frequency; and

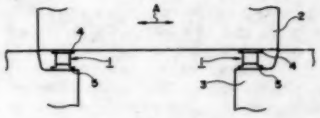
deriving the inverse Fourier transform to the time domain of the signals received from each seismic energy source.

4,953,658

SEISMIC ISOLATOR

Yozo Goto, Tokyo, Japan, assignor to Ohbayashi Corporation, Osaka, Japan

Filed Dec. 28, 1989, Ser. No. 458,377
Claims priority, application Japan, Jun. 7, 1989, 1-143155
Int. Cl.[5] F16M 1/00
U.S. Cl. 181—207 8 Claims



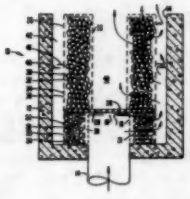
1. A seismic isolator comprising a laminated member adapted to be interposed between a structure and foundation, said laminated member comprising thin steel sheets having concavities and convexities extending in a single direction, flexible sheets stacked alternately with said steel sheets, and upper and lower end plates, said steel sheets, flexible sheets and upper and lower end plates being unitarily and fixedly bonded together, said upper and lower end plates being fixed to said structure and said foundation, respectively, in such a manner that said concavities and convexities extend in a direction in which earthquake vibrations are to be isolated from said structure.

4,953,659

FLUID BLOW-OFF MUFFLER

Thomas R. Norris, 15 Patricia Rd., Orinda, Calif. 94563

Filed Aug. 25, 1989, Ser. No. 398,792
Int. Cl.[5] F01N 1/10
U.S. Cl. 181—257 40 Claims



1. A method for muffling sound of flowing fluid comprising the steps of:

introducing a pressurized fluid into a first flow resisting means disposed within a housing having fluid inlet and outlet means;

passing substantially all of the fluid from the first flow resisting means into a first void disposed within the housing;

splitting the flow in the first void into first and second subflows;

passing the first subflow from the first void into a second flow resisting means disposed within the housing;

passing the first subflow out of the housing; and

passing the second subflow from the first void out of the housing without passing into the second flow resisting means.

15. A device for muffling the sound of flowing fluid, the fluid having a pressure and the device having fluid resistance characteristics, comprising:

a housing;

a fluid inlet disposed in the housing;

a fluid outlet disposed in the housing;

a first void disposed in the housing, the void being in fluid communication with the fluid outlet of the housing;

first means for attenuating the sound of flowing fluid, the first means being disposed in the housing, the first means having an inlet and an outlet, the first attenuating means inlet being in fluid communication with the fluid inlet of the housing, the first attenuating means outlet being in fluid communication with the first void;

second means for attenuating the sound of flowing fluid, the second means being disposed in the housing, the second means having an inlet and an outlet, the second attenuating means inlet being in fluid communication with the first void, the second attenuating means outlet being in fluid communication with the fluid outlet of the housing; and

means for splitting the fluid flowing in the first void into first and second and separate subflows, the first void communicating the first subflow with the first attenuating means inlet and the second subflow with the fluid outlet of the housing.

4,953,660

MUFFLER WITH TWO PART HOUSING AND FLOW TUBES

Raymond S. Jewell, Jr., Jackson, and William E. Hill, Ann Arbor, both of Mich., assignors to Tennessee Gas Pipeline Company, Lincolnshire, Ill.

Filed Feb. 9, 1989, Ser. No. 308,134
Int. Cl.[5] F01N *1/02, 1/08, 7/18*
U.S. Cl. 181—282 **20 Claims**

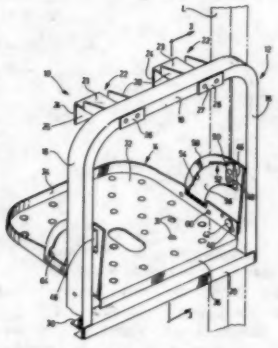
1. A sound attenuating exhaust gas muffler for automotive type exhaust gas systems comprising a housing having an inlet collar and an outlet collar, said housing including an upper sheet metal blank having a rim extending all around the blank and having a pair of recesses drawn in the blank inside of said rim, said upper blank having a divider section extending from one side of the rim to the other and located between and at adjacent edges of the recesses, said rim and said divider section of said upper blank being coplanar and substantially flat, said housing including a lower sheet metal blank having a rim extending all around the blank and having a pair of recesses drawn in the blank inside of said rim, said lower blank having a divider section extending from one side of the rim to the other and located between and at adjacent edges of the recesses, said rim and said divider section of said lower blank being coplanar and substantially flat, the rims of the upper and lower sections and the divider sections of said upper and lower sections fitting against each other to form said housing, the recesses of the upper blank extending upwardly away from the plane of the fitted together rims and the recesses of the lower blank extending downwardly away from the plane of the fitted together rims, the recesses of the upper blank being aligned with the recesses of the lower blank and each pair of aligned upper and lower blank recesses combining to form an internal chamber whereby said housing has a pair of internal chambers separated by said fitted together divider sections, said divider sections each having a curved portion therein providing communication between the adjacent recesses, the curved portions of the divider sections in the upper and lower blanks being aligned and combining to form a tubular passage, a gas flow tube fitting in said tubular passage and providing for gas flow between the internal chambers, said inlet and outlet collars being in gas flow communication with said internal chambers.

4,953,661

LADDER ATTACHMENT

Allan R. Hilton, 10 Crawford Avenue, Chorley, Lancashire, England PR7 4DY, and Phillip Mathews, 1 Mansion Street, Bramalea, Ontario, Canada L6S 3C9

Filed Oct. 17, 1989, Ser. No. 422,531
Int. Cl.[5] E06C *7/14, 7/16*
U.S. Cl. 182—120 **14 Claims**



1. A ladder attachment for use with a ladder having side members and a plurality of rungs, said ladder attachment being adapted to be attached to two said rungs intermediate the ends of said ladder, said ladder attachment comprising:

frame means having opposed parallel side frame members, and opposed parallel upper and lower frame cross members extending between said side members and forming a generally rectangular four-sided frame, and adapted to be releasably attached to said rungs on said ladder intermediate said ends, and defining upper and lower ends;

support means extending from side to side of said frame means between said side members, and being swingably mounted to said frame means adjacent said lower end thereof, and being swingable between a retracted position, and an extended position angled away from said frame means, and extending through said ladder between said side members and said rungs whereby to provide support means when said ladder is in use at an angle and thereby support a person working on said ladder;

downwardly open attachment means secured to said upper frame cross member, said attachment means being interengageable with a rung of said ladder by downward movement of said frame means relative to said ladder and being releasable therefrom by upward axial movement relative thereto, and,

means on said frame means remote from said downwardly open attachment means for engaging said ladder and restraining lateral movement of said frame means relative to said ladder.

4,953,662

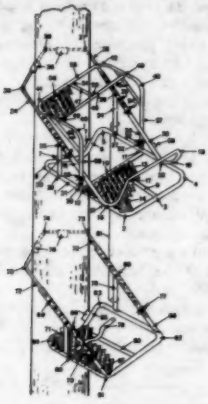
CLIMBING APPARATUS

William M. Porter, 404 White Store Rd., Wadesboro, N.C. 28170

Filed Jan. 17, 1989, Ser. No. 297,123
Int. Cl.[5] A45F *3/26;* A47C *9/10*
U.S. Cl. 182—135 **10 Claims**

1. An apparatus for climbing a tree or like vertical columnar member comprising an upper climbing member including a

main frame having a tree engagement gripper support attached to the terminal ends of the main frame, lower gripper means attached to said gripper support and positioned to provide gripping pressure against a tree, a shaped rail attached to said main frame opposite the terminal ends thereof, and comprising an elevated safety-bar portion in the form of a convoluted loop with two open ends, a tree engagement portion in telescopic sliding adjustment engagement with the open ends of the shaped rail for selectively affixing the shaped rail to a tree, upper gripper means attached to the tree engagement portion



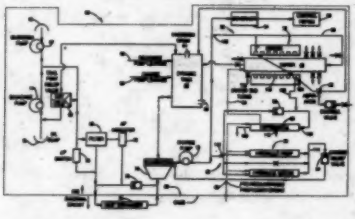
and positioned to provide gripping pressure against the tree, a plurality of vertical rear bracing means positioned near the terminal ends of the main frame and joining the main frame to the shaped rail, a main frame platform covering the area between the center and the non-terminal ends portion of the main frame, a plurality of opposed vertical center bracing means joining said main frame and shaped rail a pair of pivotable tubular holders mounted on opposed vertical center bracing means, a detachable seat telescopically inserted into the tubular holders and a foot climber member.

4,953,663

OIL SUPPLY FOR INTEGRATED DRIVE GENERATOR

Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 17, 1989, Ser. No. 324,756
Int. Cl.[5] F01M 9/00
U.S. Cl. 184—6.12 **25 Claims**



1. An integrated drive generator oil supply for providing pressurized oil to a constant speed drive transmission, which drives a rotor of an alternating current generator at a constant velocity to generate constant frequency alternating current, and to at least one additional apparatus requiring pressurized oil and discharging oil into an oil reservoir during generation of the alternating current comprising:

a pump for providing pressurized oil from the oil reservoir of the integrated drive generator;

means for providing pressurized oil from the pump to an oil circuit within the alternating current generator for cooling the alternating current generator; and

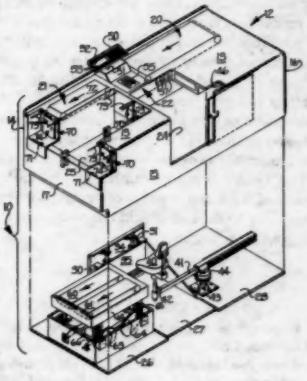
means for providing oil directly from oil discharged from the oil circuit to at least a part of the constant speed drive transmission which after lubricating the constant speed drive transmission is discharged into the oil reservoir.

4,953,664

ERGONOMICALLY DESIGNED CHECK-OUT COUNTER SYSTEM FOR SUPERMARKET AND MERCHANDISING INDUSTRIES

Carll D. Vrooman, and Dennis R. Taylor, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed May 4, 1989, Ser. No. 347,757
Int. Cl.[5] A47F 9/04; A63F 9/02
U.S. Cl. 186—59 **22 Claims**



1. An ergonomically designed check-out counter system for supermarket and merchandising industries characterized by provisions for differences in human heights, hand and position of operators and for ease in handling of merchandise to reduce fatigue and injury to operators while providing maximum productivity under both light and heavy throughput requirements, said check-out counter system comprising:

elongate housing means having interconnected countertop and side and end wall portions for defining generally the overall shape of said check-out counter system including an upstream end portion for receiving the merchandise being checked-out, a downstream end portion for bagging the checked-out merchandise and an intermediate portion between said upstream and downstream end portions for receiving a cashier for checking-out the merchandise, and said housing means having an opening in said intermediate portion through at least a portion of said countertop and one of said side wall portions for the positioning of a cashier and an opening in said downstream end portion through a longitudinally extending intermediate area of said countertop;

movable floor means positioned under said intermediate opening in said housing for receiving the cashier thereon and including means for moving said floor means vertically up and down to position the cashier at a desired height in said check-out counter system regardless of the human height of the cashier;

movable chair means positioned in said intermediate opening in said housing means above said floor means for receiving

the cashier and including means for adjusting the position of said chair means vertically relative to said floor means to position the cashier and his legs at desired heights and horizontally from desired positions within said intermediate opening to a position out of said intermediate opening to provide the cashier with the option of sitting at various positions within said intermediate opening or standing;

keyboard means for entering price data of the merchandise by the cashier and including means mounting said keyboard means on said housing means in said intermediate portion at a desired height and for generally horizontal movement between a position in front of the right shoulder to a position in front of the left shoulder of the cashier when facing said keyboard means for accommodating right-handed and left-handed cashiers; and

merchandise bagging means positioned in said downstream end portion of said housing means and including driven longitudinally-extending conveyor means positioned in said opening in said downstream end portion for conveying the merchandise away from the cashier and means mounting each end of said driven conveyor means for up and down generally vertical movement, so that said conveyor means may be placed in a first generally horizontal position lower than said countertop for receiving a bag at the end thereof adjacent to the cashier for direct bagging by the cashier by sliding the merchandise directly off said countertop and into the bag for conveying of the bagged merchandise away to the end of said check-out counter system, and so that said conveyor means may be placed in a second generally downwardly angled position extending from said countertop for transfer by the cashier of the merchandise from said countertop to said conveyor means for conveying to the end of said check-out counter system for bagging by a bagger.

4,953,665

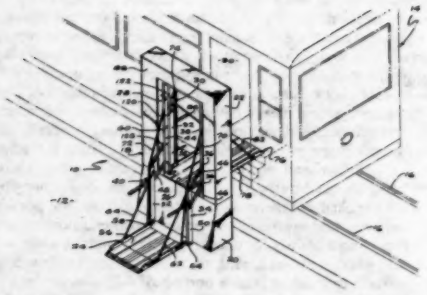
WAYSIDE LIFT

Gregory J. Paquin, Los Angeles, Calif., assignor to Ricon Corporation, Pacoima, Calif.

Division of Ser. No. 142,040, Jan. 11, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,009

Int. Cl.[5] B66B *9/20*

U.S. Cl. 187—9 R **8 Claims**



1. A lift apparatus for providing handicapped access from a landing to a guideway mounted vehicle comprising:

a support structure having a lift opening on a first side and a bridge opening on a second side opposite the first side, comprising:

a pedestal defining a top surface and

a housing extending upward from the pedestal, the housing having a top region and a passageway therethrough between the lift opening and the bridge opening,

lift means mounted in the lift opening of the support structure comprising:

a right linkage have an upper end mounted to the housing along one side of the passageway;

a left linkage having an upper end mounted to the housing along the other side of the passageway opposite the one side, the right linkage and the left linkage each having a lower end;

a platform coupled for pivotal movement about the lower ends of the right and left linkages;

means for preventing pivotal movement of the platform below a generally horizontal position, and

lift movement means coupled for selectively moving the platform between a lowered position adjacent the landing and a raised position adjacent the top surface of the pedestal and selectively pivoting the platform between the raised position and a vertical lift storage position in the passageway adjacent the lift opening;

bridge means mounted in the bridge opening of the support structure comprising;

a bridge member mounted to the support structure for pivoting between a generally horizontal position for providing access from the top surface of the pedestal along the bridge to the guideway mounted vehicle, and a generally vertical bridge storage position in the passageway adjacent the bridge opening;

bridge movement means coupled for selectively moving the bridge between the horizontal position and the bridge storage position; and

bridge control means for selectively actuating the bridge movement means; and

lift control means for selectively actuating the lift movement means.

4,953,666

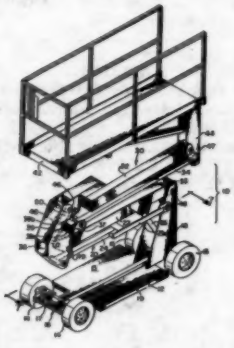
ELEVATING APPARATUS HAVING AN OFFSET UPPER BOOM MAINTAINING A WORKSTATION LEVEL ON A CANTILEVERED ANGULARLY MOVABLE SUPPORT THAT RETRACTS INTO A COMPACT POSITION

James Ridings, Glenmoore, Pa., assignor to Strato-Lift,Inc., Morgantown, Pa.

Filed Mar. 31, 1989, Ser. No. 332,291

Int. Cl.[5] B66B *9/20;* **B66F** *11/04*

U.S. Cl. 187—9 R **4 Claims**



1. An elevating apparatus having a stored position and multiple extended positions comprising

a support base;

a first boom assembly including an elongated first boom and an elongated first control arm of length substantially equal thereto and in a substantially parallel relationship therewith, said first boom and said first control arm each having a distal end and a pivot end, the pivot end being pivotally connected to said support base such that the first boom assembly is movable in a vertical plane between a

multiplicity of positions ranging from a downwardly declining limit position to an upwardly inclining limit position;

a lifting means operatively connected to said first boom;

a boom assembly coupler pivotally connected to the distal ends of the first boom and the first control arm;

a second boom assembly including an elongated second boom and a second control arm assembly, said second boom having a pivot end pivotally connected to said boom assembly coupler and having a distal end laterally offset from said pivot end of said first boom assembly to afford movement of said distal end of the second boom between opposite limit positions corresponding to the limit position of said first boom assembly, said offset affording travel of the second boom distal end past the pivot end of the first boom assembly as the boom assemblies move from the upwardly inclining positions to the downwardly declining positions, said second control arm assembly including an elongated, straight second control arm having a pivot end and a distal end, and second control arm pivot means for pivotally connecting the pivot end of said second control arm to said boom assembly coupler such that said pivot end is laterally offset from the second boom pivot end by a distance less than the offset of the distal end of the second boom from its pivot end, so as to be out of said vertical plane of movement of the first boom, said second control arm pivot means including a pivot mounting connection, said pivot mounting connection being fixedly mounted on a side of the boom assembly coupler proximate to said laterally offset distal end of the second boom, the pivot end of said second control arm being pivotally mounted at the pivot mounting connecting so as to be axially offset from the pivot of said second boom, said second control arm further being substantially equidistant from said second boom and angularly disposed with respect to said vertical plane of movement of the first boom assembly;

a rigid compression link operatively interconnected within said vertical plane between the distal end of said first boom and the pivot end of said second boom such that the movement of the first boom assembly causes movement of the second boom assembly;

a workstation; and

a workstation support member with a rigid end rigidly connected to said workstation and a pivot end pivotally connected to the distal end of the second boom assembly such that said workstation remains in a level attitude throughout the range of movement of said first and second boom assemblies.

4,953,667

WHEEL BRAKING DEVICE, PARTICULARLY FOR A BABY CARRIAGE

Jean Bigo, Cholet, France, assignor to AMPAFRANCE, Boulogne-Billancourt, France

Filed May 26, 1989, Ser. No. 357,714

Claims priority, application France, May 26, 1988, 88 07012

Int. Cl.[5] B60T *1/06*

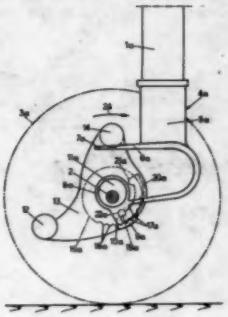
U.S. Cl. 188—31 **11 Claims**

1. A wheel braking device, particularly for a baby carriage, comprising:

a chassis mounted by means of a connection member of the suspension type, or directly on at least one axle common to a pair of wheels and

a brake member operated by a brake pedal and adapted for braking the rotation of at least one wheel, wherein the brake pedal is mounted to rotate with the axle wherein the suspension comprises

two suspension members of which at least one is mounted near a wheel about an eccentric fastened to the axle each suspension member having a brake member; wherein at least one wheel is provided with a brake drum fastened thereto and adapted to cooperate on its periphery with a corresponding brake member when the axle is turned in a first direction through action on



the brake pedal, thus bring the brake member towards and in contact with the periphery of the brake drum.

4,953,668

ACTUATOR

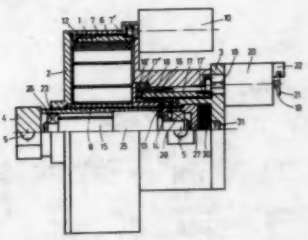
Lars M. Severinsson, Hishult, Sweden, assignor to SAB Nordic AB, Landskrona, Sweden

Filed Mar. 20, 1989, Ser. No. 326,118

Claims priority, application Sweden, Mar. 21, 1988, 8801027

Int. Cl.[5] B61H *13/00*; F16D *65/34*

U.S. Cl. 188—158 **9 Claims**



1. An actuator, comprising in combination a housing, a drive sleeve to be subjected to rotational movement and a drive ring for supplying a rotational movement, clutch means coupled between the drive sleeve and the housing for permitting rotation of the drive sleeve in a first direction, a locking spring for connection between the drive sleeve and the drive ring and coaxial therewith, and means for controlling the locking spring to drivingly connect the drive sleeve with the drive ring only at the rotation of the drive sleeve in the first direction but to allow rotation of the drive ring in a second opposite direction.

4,953,669

ELECTRO-MECHANICAL BRAKE UNIT, PREFERABLY FOR A RAIL VEHICLE

Lars M. Severinsson, Hishult, Sweden, assignor to SAB Nife AB, Landskrona, Sweden

Filed Mar. 20, 1989, Ser. No. 326,119

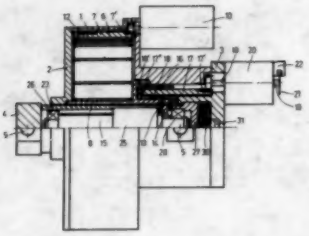
Claims priority, application Sweden, Mar. 21, 1988, 8801026

Int. Cl.[5] R61H *13/00*; F16D *65/34*

U.S. Cl. 188—171 **10 Claims**

1. A brake unit, comprising energy storing means for providing energy by rotational movement, electric motor and drive means for supplying energy to said storing means, and a drive

mechanism for transmitting a rotational movement from said energy storing means to conversion means for transforming said rotational movement into an axial movement of a force transmitting member, characterized in that clutch and control



means are arranged between the drive mechanism and said conversion means for accomplishing a controlled force transmission from the energy storing means to the force transmitting member.

4,953,670

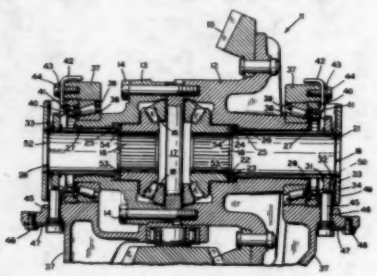
VEHICLE WHEEL SPEED SENSOR

Tad M. Chemelewski, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 30, 1988, Ser. No. 278,039

Int. Cl.[5] B60T *8/02*

U.S. Cl. 188—181 A **15 Claims**



1. An apparatus for sensing the angular speed of a wheel mounted on the end of a drive axle of a vehicle, the drive axle including a housing enclosing an axle shaft and a differential carrier assembly with a side gear for rotating the axle shaft and an associated wheel, comprising:

a tone wheel having a plurality of generally evenly spaced radially extending teeth formed thereon and means for detachably coupling said tone wheel for rotation with an axle shaft;

a sleeve adapted to be rotatably mounted inside a housing for enclosing an axle shaft, said sleeve having means formed at an outer end thereof for engaging said means for detachably coupling said tone wheel and means formed at an inner end thereof for detachably coupling to a side gear of a differential carrier assembly for rotation of said sleeve;

a generally radially outwardly extending flange formed on said inner end of said sleeve and being adapted to cooperate with a differential case mounted in the housing to restrict axial movement of said sleeve with respect to the housing; and

a sensor adapted to be mounted through a wall of the housing adjacent a periphery of said tone wheel for detecting the passage of said teeth as the side gear rotates said sleeve and said tone wheel whereby a predetermined air gap is maintained between said sensor and said tone wheel.

4,953,671

DAMPING FORCE ADJUSTABLE HYDRAULIC SHOCK ABSORBER

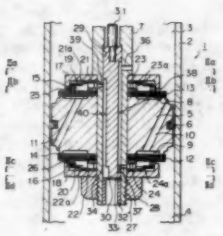
Tomio Imaizumi, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Aug. 10, 1989, Ser. No. 392,270

Claims priority, application Japan, Aug. 12, 1988, 63-201313

Int. Cl.[5] F10F *9/44*

U.S. Cl. 188—299 **6 Claims**



1. A damping force adjustable hydraulic shock absorber comprising:

a piston attached to one end of a piston rod and slidably fitted in a cylinder, said piston dividing the interior of said cylinder into two cylinder chambers;

a passage provided in said piston, said passage communicating with each of said two cylinder chambers;

a damping force generating valve provided at the downstream side of said passage to generate a-damping force;

a back-pressure chamber formed at the side of said damping force generating valve which is remote from said piston to apply pressure to said valve;

a bypass passage formed in said piston rod to provide communication between said back-pressure chamber and the upstream cylinder chamber that is provided at the upstream side of said passage; and

a shutter externally operated to control the condition of communication between said upstream cylinder chamber and said back-pressure chamber, thereby adjusting the level of pressure inside said back-pressure chamber.

4,953,672

CONTROL CABLE SYSTEM WITH DEVICE FOR REDUCING VIBRATION

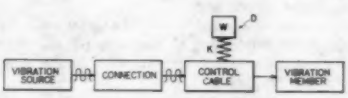
Sadahiro Onimaru, Minoo; Fumiyasu Kuratani, Akashi, and Hiroyoshi Yoshino, Takarazuka, all of Japan, assignors to Nippon Cable System, Inc., Takarazuka, Japan

Filed Mar. 31, 1989, Ser. No. 331,209

Claims priority, application Japan, Apr. 28, 1988, 63-106604; Apr. 28, 1988, 63-106606

Int. Cl.[5] F16F *7/10*

U.S. Cl. 188—378 **26 Claims**



1. A control cable system with a damper for reducing a vibration comprising:

a control cable for transmitting a mechanical displacement and which has one end connected to a vibration source and vibrates in an axial direction;

means locating a vibration member on said control cable and which resonates due to a vibration transmitted by said control cable from said source; and

dynamic damper means attached to an element of said control cable and located concentrically relative to said control cable, said dynamic damper means vibrating in response to frequencies in a range including a plurality of resonance frequencies of said vibration member and resonating in response to a predetermined one of said resonance frequencies,

whereby the posture of said dynamic damper means can be easily determined without measurement of direction of vibration since the control cable vibrates in an axial direction and the dynamic damper means does not introduce any stroke-loss to the control cable since the dynamic damper means is located concentrically relative to the control cable and not directly inserted in the operational force transmitting route of the control cable system.

4,953,673

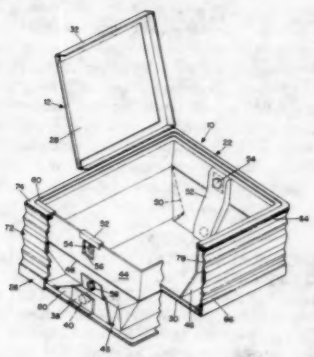
EXPANDABLE LUGGAGE

Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024

Filed Jul. 17, 1989, Ser. No. 381,458

Int. Cl.[5] A45C *7/00, 13/04, 13/36*

U.S. Cl. 190—103 **4 Claims**



1. An item of expandable luggage comprising a rigid top peripheral frame, a rigid bottom peripheral frame, a rigid intermediate peripheral frame, each frame having side and end portions fully bounding a planar, substantially rectangular opening and all such openings being of the same size, a rigid rectangular top wall member affixed to the top frame, a rigid rectangular bottom wall member affixed to the bottom frame, an upper peripheral wall member of a pleated sheet material affixed to and extending coextensively with the top and intermediate frames, a lower peripheral wall member of pleated sheet material affixed to and extending coextensively with the bottom and intermediate frames, the pleats of the peripheral wall members extending peripherally so that the peripheral wall members can be selectively expanded and collapsed to define a larger volume and a smaller volume of the luggage item, and foldable rigid side and end wall members, each having an upper portion rigidly affixed to the top frame along a corresponding side or end portion thereof inwardly of the pleated wall members and disposed orthogonally to the plane of the opening defined by the top frame and a lower portion foldable along a fold line parallel to the top and bottom frames, the fold lines of all of the rigid said and end wall members being equidistant from the top of same to further define when unfolded the large volume and when folded the smaller volume.

4,953,674

GARMENT BAG APPARATUS

Scott D. Landes, 9906 Kell Ave. S., Bloomington, Minn. 55437

Filed Nov. 8, 1989, Ser. No. 433,281

Int. Cl.[5] A45C *3/08, 13/10, 13/22, 13/38*

U.S. Cl. 190—108 **8 Claims**

1. A garment bag apparatus for an airline traveler that permits the traveler to use a collapsible garment bag carrier to protect a garment bag during transfer of the garment bag from one airport to another airport with the garment bag carrier sufficiently large so as to both protect the garment bag and to stow items before checking the garment bag apparatus at an airlines comprising:

a first shell of flexible material, said first shell having at least three edges;

a second shell of flexible material, said second shell having at least three edges, said first shell connected to said second shell to permit a user fold said first shell against said second shell, said first shell and said second shell having a first opening, a second opening, and a third opening;

closure means connecting said first shell to said second shell to permit a user to temporarily fasten said first shell to said second shell to define a compartment therebetween, said compartment sufficiently large so as to separately and in a side by side relationship contain the garment bag and miscellaneous traveler items, said first shell, said second shell, and said closure means defining the collapsible garment bag carrier;

a handle connected to said first shell to permit a user to carry said first shell and said second shell;

a first flap located over the first opening in one of said shells, said first flap having closure means to permit a user to open said first flap and extend a shoulder strap of the garment bag through the first opening;

a second flap located over the second opening in one of said shells, said second flap having closure means to permit a user to open said second flap and extend the shoulder strap of the garment bag through said second opening so that a traveler can carry the garment bag located in said first shell and said second shell with the shoulder strap of the garment bag, said first flap and said second flap operable for closing to permit a traveler to stow the shoulder strap of the garment bag during the transfer of the garment bag between airport terminals;

a third flap extending over the third opening, said third flap located between said first flap and said second flap to permit a user to extend a handgrip of the garment bag through the third opening to permit a traveler to carry the garment bag located in said shells by either the shoulder strap of the garment bag or the handgrip of a garment bag said first flap, said second flap and said third flap completely operable for closing over the said openings to protect shoulder strap and handgrip during airport handling of the garment bag, and

a pouch, said pouch made of a flexible material, said pouch having a compartment sufficiently large to nest the collapsible garment bag carrier therein when the collapsible garment bag carrieer is in a collapsed condition, said pouch including a fastener to permit a traveler to temporarily attach said pouch to the garment bag if the traveler does not want to use the collapsible garment bag carrier.

4,953,675

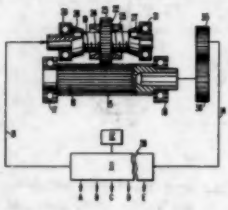
SIMPLY SUPPORTED SECONDARY SHAFTING SYSTEM TORQUE SENSOR

Allyn M. Aldrich, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 17, 1989, Ser. No. 297,322

Int. Cl.[5] F16D *43/22*

U.S. Cl. 192—8 R **16 Claims**



1. A torque manner in a secondary shafting system operatively associated with a primary shafting system, comprising:

a first rotatable shaft simply supported between bearings and receiving a first torque input from the secondary shafting system;

a second rotatable shaft simply supported between bearings and receiving a second torque input from the secondary shafting system;

a threaded portion being associated with said first rotatable shaft;

a first gear threadably mounted on said threaded portion for axial movement along said first rotatable shaft;

a second gear associated with said second rotatable shaft and in meshing engagement with said first gear throughout the axial movement of said first gear as a result of differential motion between said first and second rotatable shafts when torque is transmitted between said first and second shafts resulting from different first and second torque inputs thereto, wherein said differential motion does not occur when said first and second torque inputs are the same and the primary and secondary shafting systems are rotating at normal speeds; and

means for causing friction is jamming between said first gear and said first rotatable shaft at an end of said first rotatable shaft,

whereby the simply supported first and second rotatable shafts minimizes oscillatory motion and premature failures of the torque sensor.

4,953,676

SPRING COUPLER

Yukifumi Yamada; Takami Terada, both of Toyota, and Keiichi Hibino, Okazaki, all of Japan, assignors to Aisin Seiko Co. Ltd., Japan

Filed May 24, 1988, Ser. No. 197,919

Claims priority, application Japan, May 29, 1987, 62-85277[U]

Int. Cl.[5] F16D *67/00*

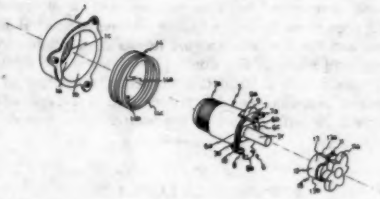
U.S. Cl. 192—8 C **1 Claim**

1. A spring coupler comprising:

a casing;

a drive member rotatably mounted within said casing, said drive member including a shaft having a connecting section with an oval cross section and a core having an oval aperture with inner chamfered surfaces, said connecting section of said shaft being staked into said oval aperture of said core with said connecting section engaging said inner chamfered surfaces to fixedly secure said shaft to said core;

a driven member rotatably mounted within said casing, said driven member including a main portion and a core portion press fit together to be fixedly secured, said driven member core portion being engageable with said drive member core upon the rotation thereof; and



a coil spring disposed between the drive member and the casing and normally engaged with said casing, said coil spring having first and second tangs, wherein said drive member engages said first or second tang upon rotation in a clockwise or a counterclockwise direction, respectively, thereby reducing the radius of said coil spring and transmitting rotation to said driven member and whereby said driven member engages said first or second tang upon rotation in a clockwise or counterclockwise direction, respectively, thereby expanding the radius of said coil spring and preventing rotation of said drive member.

4,953,677

METHOD OF AND APPARATUS FOR CONTROLLING DIRECT COUPLING MECHANISM IN HYDRODYNAMIC DRIVING APPARATUS

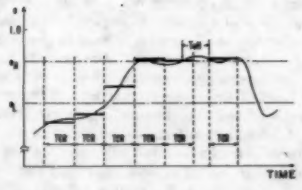
Takashi Aoki, Saitama; Satoshi Terayama, Tokyo; Yoshihisa Iwaki; Hiroyuki Shimada, both of Saitama; Kimihiko Kikuchi, Tokyo, and Hiroshi Nakayama, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,221

Claims priority, application Japan, Mar. 30, 1988, 63-77488; Mar. 30, 1988, 63-77489

Int. Cl.[5] F16H *45/02*

U.S. Cl. 192—3.3 **11 Claims**



1. A method of controlling a direct coupling mechanism disposed between input and output members of a hydrodynamic driving apparatus to mechanically connect or disconnect the input and output members, wherein engagement of the direct coupling mechanism is controlled so that a parameter indicative of slippage between said input and output members

falls in a predetermined fixed reference range, said method comprising the steps of:

determining an average value of said parameter which is measured in a prescribed time interval; determining a control value for said engagement in a next prescribed time interval based on a difference between said average value and said predetermined reference range value; and controlling engagement of said direct coupling mechanism based on said control value in said next time interval.

8. An apparatus for controlling a direct coupling mechanism disposed between input and output members of a hydrodynamic driving apparatus to mechanically connect or disconnect the input and output members, and said apparatus comprising:

a shift valve for selectively engaging and disengaging said direct coupling mechanism;

a control valve for controlling the amount of engagement of said direct coupling mechanism;

a timing valve for keeping said direct coupling mechanism in a fully engaged condition;

a first solenoid valve which can be selectively turned on and off;

a second solenoid valve which can be controlled in duty ratio;

said shift valve, said control valve, and said timing valve being controllable in operation solely by a constant oil pressure supplied dependent on the turning on and off of said first solenoid valve and a duty-ratio-controlled oil pressure supplied dependent on the duty ratio control of said second solenoid valve;

said direct coupling mechanism being operable selectively into a disengaged condition by supplying an oil pressure to a release passage thereof, a partly engaged condition by supplying a control oil pressure corresponding to said duty-ratio-controlled oil pressure to said release passage, and a fully engaged condition by cutting off the supply of the oil pressure to said release passage.

4,953,678

CLUTCH ACTUATION SYSTEM

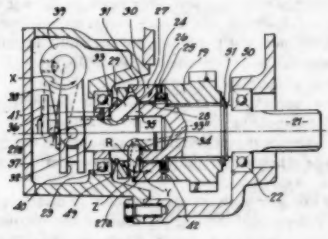
Ronald C. Page, Coventry, and Alan W. Hunt, Kenilworth, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 9, 1989, Ser. No. 349,462

Claims priority, application United Kingdom, May 11, 1988, 8811086

Int. Cl.[5] **F16D** *11/04*

U.S. Cl. 192—67 R **12 Claims**



1. A clutch actuating system comprising:

an actuating member movable between a first position in which the clutch is disengaged and a second position in which the clutch is engaged,

a pair of adjacent reaction members with mutually inclined wedging surfaces on confronting faces, one of said reaction members being operatively connected with the clutch,

and at least one elongated toggle member operatively connected at one end with the actuating member and extending between the wedging surfaces of the reaction members at its other end, the arrangement being such that movement of the actuating member from its first to its second position causes the toggle member to execute a toggle action and to be forced further between the wedging ;surfaces to separate the reaction members to engage the clutch and causes the toggle member to assume a stable position in which the actuating member is held in its second position by the transmission of force along the toggle member between its ends thus holding the clutch engaged.

4,953,679

SLIP CONTROL SYSTEM FOR LOCK-UP CLUTCH OF AUTOMATIC TRANSMISSION

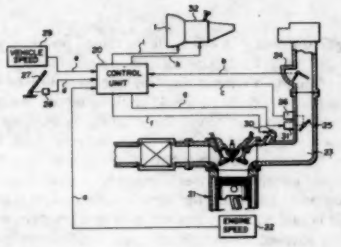
Yoshinori Okino, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 5, 1989, Ser. No. 293,689

Claims priority, application Japan, Jan. 12, 1988, 63-5336

Int. Cl.[5] **B60K** *41/02;* **F16D** *47/06*

U.S. Cl. 192—0.096 **8 Claims**



1. In a slip control system for an automatic transmission of an automotive vehicle having fuel cut means for interrupting a fuel supply to an engine when an engine operating condition is in a predetermined fuel cut zone, including a torque converter disposed between the engine and the automatic transmission for controlling an amount of a torque transmitted from the engine to the transmission, lock-up clutch means provided in the torque converter for connecting an input and output member of the torque converter directly, the improvement comprising slip control means for controlling an engaging force of the lock-up clutch means to accomplish a slip condition in which a predetermined rotation speed difference is produced between the input member and output member of the torque converter, the slip condition being defined as an intermediate condition between a lock-up condition in which a rotation speed of the input member of the torque converter is substantially the same as a rotation speed of the output member thereof and a converter condition in which the lock-up clutch means is fully released, transient control means for controlling the engaging force of the lock-up clutch means to accomplish a target rotation speed difference between said input member and said output member greater than said predetermined rotation difference in the slip condition when the engine operating condition is a transient zone included in the fuel cut zone and adjacent to a fuel supply zone in which a fuel is supplied for the engine.

4,953,680

CLUTCH ADJUSTER

Richard A. Flotow, Butler, and Patrick M. Sullivan, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio

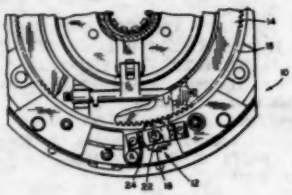
Filed Mar. 29, 1989, Ser. No. 330,234

Int. Cl.[5] **F16D** *11/00, 13/75*

U.S. Cl. 192—111 B **8 Claims**

1. In a clutch adjuster adapted to compensate for disc wear

in a friction clutch including a cover and an adjusting ring rotatable relative to said cover, said adjuster including a rotatory gear supported by said cover, said rotary gear in mesh with said adjusting ring, said adjuster further including an adjuster shaft extending through said cover and having one end thereof fixed to said rotary gear, said shaft having means external to said cover for rotating said shaft, by which means said rotary gear and said adjusting ring are also rotated; an improvement comprising: resilient means positioned external to said cover, said resilient means adapted to secure said adjuster against rotation in a first, unrestrained position, wherein aid adjuster may be freely rotated whenever said resilient means is biased to a second position by application of a disengagement force by depressing said resilient means wherein said means external to said cover for rotating said adjuster shaft comprises a bolt head on said shaft, wherein said resilient means is fixed to said cover for securing said adjuster, and wherein said means comprises a spring lock including an aperture sized and positioned for surrounding and engaging said bolt head in said normally unrestrained first position, said lock thus being adapted to restrain said bolt head against rotation.

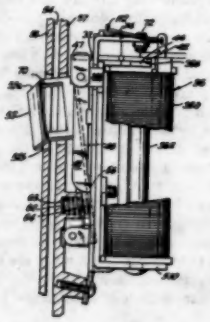


4,953,681

COMPACT, LOW POWER GATE APPARATUS FOR COIN OPERATED MACHINES

John Zouzoulas, West Chester, Pa., assignor to Mars Incorporated, McLean, Va.

Filed May 26, 1988, Ser. No. 199,138
Int. Cl.[5] G07F 9/04
U.S. Cl. 194—346 **26 Claims**



19. A gate apparatus for controlling the direction of travel of a coin moving along a coin path of a coin operated machine, said gate comprising,

a coin diverting plate, a pivot, and a means for rotating said plate about said pivot;

said plate having a first angle of inclination along a coin path for directing said coin along said coin path; and

a second angle of inclination toward a side wall of said coin path for diverting said coin against said wall, dissipating its kinetic energy,

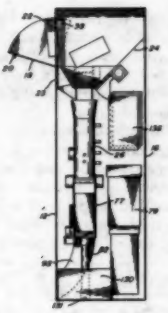
wherein said second angle of inclination directs a component of force due to an impact of a coin on said plate perpendicular to said second angle of inclination, toward said pivot point.

4,953,682

AUTOMATIC REVERSE VENDING MACHINE FOR ALUMINUM CAN RECYCLING

Salah Helbawi, 49 De La Moselle, St. Lambert, Quebec, Canada J4S 1W1

Filed Apr. 25, 1989, Ser. No. 342,803
Int. Cl.[5] G07F 7/06
U.S. Cl. 194—208 **17 Claims**



1. An apparatus for receiving aluminum cans, detecting and rejecting ferrous metal and non metal cans or other items, crushing aluminum cans, and providing compensation for the crushed aluminum cans, comprising:

a sheet metal enclosure;

opening in the front of the sheet metal enclosure for receiving aluminum cans and other items leading to a chute to guide aluminum cans and other items, to fall one at a time with a cylindrical axis of each can substantially vertical;

dispensing means at the bottom of the chute to release one aluminum can or other item individually through an aperture in a sole plate under the chute;

detector means to detect if a can or other item to be released by the dispensing means is ferrous metal or non metal;

reject deflector means to deflect ferrous metal and non metal cans or other items falling through the aperture in the sole plate, to a reject chute;

at least one gate with opening and closing means to close on the underside of the sole plate across the aperture;

hydraulic cylinder with vertical moving cylinder rod positioned under the sole plate, the cylinder rod having a platen at the top to crush an aluminum can against the closed gate on the underside of the sole plate;

ejection plate positioned on top of the platen with pivot means to flip up and discharge a crushed aluminum can into a discharge container at the bottom of the enclosure, and

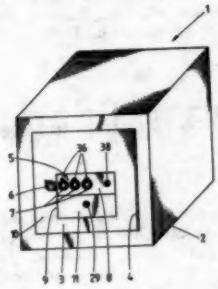
compensation dispensing means for dispensing compensation commensurate with the number of aluminum cans crushed.

4,953,683

SAFE EQUIPPED WITH A PERMUTATION LOCK WHOSE LOCKING FUNCTION IS RELEASED BY THE INSERTION OF A COIN OR COINS

Armin Eisermann, Velbert, Fed. Rep. of Germany, assignor to Schulte Schlagbaum Aktiengesellschaft, Velbert, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,771
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3605859; Jul. 19, 1986, 8619493[U]
Int. Cl.[5] E05G *1/02*
U.S. Cl. 194—235 28 Claims



1. A safe comprising
a safe door;
a permutation lock including a bolt slide for locking said door, the permutation lock having an externally operable reset device for resetting a combination of the lock;
a coin-operated release mechanism adapted for releasing the bolt slide of said lock for locking said door of the safe and wherein
said coin-operated release mechanism comprises an auxiliary lock;
said auxiliary lock includes an auxiliary locking slide operable by said release mechanism for locking said safe;
said release mechanism is operative to release a locking function of said release mechanism upon insertion of a coin;
upon insertion of the coin, said auxiliary lock operates to release said auxiliary locking slide to move in coupled connection with said bolt slide of the permutation lock;
said coin-operated release mechanism includes a supplementary lock for releasing a locking element in said release mechanism without the insertion of a coin, and wherein
said supplemental lock includes a web and a locking pawl operative with said locking slide, said pawl being movable to an unlocking position by operation of a coin or said web.

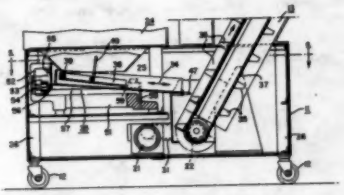
4,953,684

STOPPER ELEVATOR CONVEYOR

Frank Beswick, Phoenixville, and Robert W. Winship, Downington, both of Pa., assignors to The West Company, Incorporated, Phoenixville, Pa.

Continuation of Ser. No. 76,777, Jul. 17, 1987, Pat. No. 4,856,640. This application Nov. 7, 1988, Ser. No. 267,823
The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.
Int. Cl.[5] B65G *41/00*
U.S. Cl. 198—311 4 Claims

1. The device for transferring small discrete objects such as pharmaceutical stoppers and caps comprising:
a frame having locking castors and movably positionable at a predetermined location for delivery of said objects;
an angularly displaced conveyor on said frame and having a discharge chute at a predetermined location for discharging objects thereof, said conveyor including a conveyor chain means defining a path from a transfer point to said discharge chute, said chain having bucket flight means including holes in said flights to convey said objects along said path while subjecting said objects to an ambient drying condition;
a delivery chute on said frame for transferring said objects to said transfer point, said delivery chute including a first tray inclined with respect to the horizontal and having an open lower terminal end adjacent said transfer point, which end is positioned to feed said objects to said conveyor chain, said end including terminal plate means hinged to be deflected upon contact with objects carried



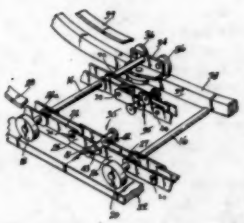
by said conveyor, said delivery chute further including a second tray located within said first tray at the same or greater angle with respect to the incline of the first tray and positioned to receive said objects, said second tray having an open lower terminal end for feeding said objects to said first tray, said first tray being mounted to said frame on a plurality of leaf spring means, and said delivery chute further including vibrating means for oscillating said trays to impart linear movement of said objects toward the lower terminal ends of said trays; and
hopper means removably mounted on said frame for holding a quantity of said objects, said hopper being mounted on a detachable mobile frame and including a hopper chute for gravity feed of said objects to said delivery chute.

4,953,685

STEP CHAIN FOR CURVED ESCALATOR

Gerald Johnson, Farmington, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Aug. 10, 1989, Ser. No. 391,893
Int. Cl.[5] B65G *21/00*
U.S. Cl. 198—328 11 Claims



7. A step chain for an escalator assembly which escalator assembly moves along a curved path of travel when viewed in plan, said step chain comprising:
(a) a plurality of serially connected links having overlapping ends;
(b) means for connecting escalator step axles to spaced apart ones of said links; and
(c) rotatable eccentric camming means connecting adjacent

adjustable links intermediate said spaced apart ones of said links for varying the extent of overlap of said adjustable links to selectively increase and decrease the effective length of said chain while maintaining rectilinear alignment of said adjustable links at the maximum and minimum effective lengths of the chain.

4,953,686

BALUSTRADE FOR A TRANSPORTATION APPARATUS ESPECIALLY AN ESCALATOR OR A PASSENGER WALKWAY

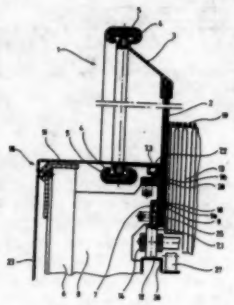
Gerhart Rülke, Vienna, Austria, assignor to Inventio AG, Hergiswil, Switzerland

Filed Jul. 5, 1989, Ser. No. 375,741

Claims priority, application Switzerland, Jul. 11, 1988, 02645/88

Int. Cl.[5] B66B *23/22*

U.S. Cl. 198—332 11 Claims



1. A balustrade for a transportation apparatus, especially an escalator or a moving passenger walkway, comprising:

a support body member;

two spaced apart oppositely disposed balustrade side walls;

said two spaced apart oppositely disposed balustrade side walls being supported inwardly of the support body member;

each balustrade side wall being provided with a movable handrail;

endless revolvingly driven transport means arranged between said balustrade side walls;

outer cover means mounted at said support body member laterally outwardly of said two spaced apart oppositely disposed balustrade side walls;

said outer cover means having two oppositely disposed sides associated with respective ones of said two spaced apart oppositely disposed balustrade side walls;

outer deck cover means of said outer cover means being arranged at both of said two oppositely disposed sides of said outer cover means;

said balustrade side walls being arranged substantially in upright disposition;

balustrade panel means provided for each one of said balustrade side walls and defining glass plates;

said balustrade panel means laterally guiding said endless revolvingly driven transport means;

said endless revolvingly driven transport means being provided with thread element means having a predetermined width;

said balustrade panel means being spaced from one another at a distance which is slightly greater than the predetermined width of the tread element means;

said endless revolvingly driven transport means having a treadable forward run as viewed in a transport direction of the transportation apparatus; and

said threadable forward run of said endless revolvingly driven transport means being arranged such as to protrude above the outer deck cover means and to be visible through said glass plates defining said balustrade panel means of said two spaced apart oppositely disposed balustrade side walls.

4,953,687

METHOD AND APPARATUS FOR AUTOMATICALLY TRANSFERRING AND ACCUMULATING GROUPS OF FLACCID ARTICLES

Vinicio Gazzarrini, Firenze, Italy, assignor to Solis S.R.L., Firenze, Italy

Filed Sep. 22, 1988, Ser. No. 247,709

Claims priority, application Italy, Sep. 22, 1987, 9491 A/87

Int. Cl.[5] B65G *25/00*

U.S. Cl. 198—347.1 15 Claims

1. A method of automatically transferring and accumulating groups of flaccid articles such as pantyhose or other hosiery or similar articles between loading and unloading stations and to and from intermediate accumulating stations and wherein there is a pair of said loading stations and one unloading station between said loading stations, comprising:

loading articles at a loading station to provide a group of articles thereat;

unloading articles at an unloading station independent of said loading;

upon completion of loading a group of articles at a loading station, advancing the group of articles from the loading station toward an unloading station to an intermediate accumulating station having no group of articles thereat while retaining any particles that are at an unloading station and retaining any group of articles that are at other intermediate accumulating stations;

during each of said advancings all groups of articles of intermediate accumulating stations on the opposite side of said unloading station are retained at their respective station; and

upon unloading of all articles at an unloaded station, advancing a group of articles from an intermediate accumulating station to the unloading station.

4,953,688

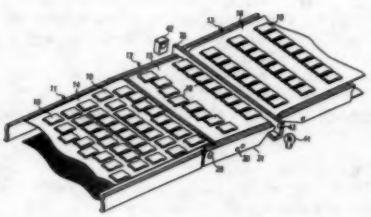
CONVEYOR WITH ARTICLE ALIGNMENT

James R. Kross, Pacific, Mo., assignor to Anheuser-Busch Companies, Inc.

Filed Jul. 21, 1989, Ser. No. 384,260

Int. Cl.[5] B65G *47/26*

U.S. Cl. 198—434 23 Claims



1. Apparatus comprising:

an alignment conveyor having an upstream end and a down-

stream end and having a first conveying surface suitable for conveying in a first direction of travel toward said downstream end a plurality of discrete articles which would be at least generally arrayed on said first conveying surface in a plurality of successive rows, each of said rows extending transversely to said first direction of travel and containing at least two of said articles, first drive means for moving said first conveying surface in said first direction of travel at a first rate of movement,

an alignment element positioned downstream of and adjacent to said downstream end of said alignment conveyor and having an article contact surface extending transversely to said first direction of travel in at least a generally horizontal direction which is at least generally parallel to said downstream end of said alignment conveyor,

means for effecting relative movement between said downstream end of said alignment conveyor and said alignment element generally vertically between a first position wherein a row of article on said first conveying surface can encounter said contact surface of said alignment element to cause the articles in the encountering row to become aligned according to said contact surface, and a second position wherein a row of articles exiting said alignment conveyor clears said alignment element,

wherein said means for effecting movement comprises pivot means for pivotably mounting said upstream end of said alignment conveyor for pivotal rotation about an axis which is at least generally parallel to said first conveying surface and at least generally perpendicular to said first direction of travel, and means for moving said downstream end of said alignment conveyor between said first and second positions by causing said alignment conveyor to pivot about said axis,

further comprising an upstream conveyor having an upstream end and a downstream end, said upstream conveyor having a second conveying surface and being positioned such that a row of articles exiting the downstream end of said upstream conveyor is received by said first conveying surface at the upstream end of said alignment conveyor and is conveyed by said first conveying surface to the downstream end of the alignment conveyor, second drive means for moving said second conveying surface at least generally in said first direction of travel at a second rate of movement which is less than said first rate of movement to thereby increase the distance between successive rows of articles on said first conveying surface as compared to the distance between successive rows of articles on said second conveying surface,

wherein said second drive means comprises a horizontally positioned drive roll for said upstream conveyor, wherein the axis about which said alignment conveyor is pivotable is the longitudinal axis of said drive roll, and wherein said first drive means comprises a drive roll for said alignment conveyor and means for rotating said drive roll for said alignment conveyor responsive to the rotation of said drive roll for said upstream conveyor.

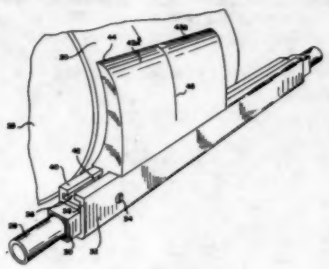
4,953,689

CONVEYOR BELT CLEANER

Edwin H. Peterson; Harold M. Stetson, both of Neponset, and Robert T. Swinderman, Kewanee, all of Ill., assignors to Martin Engineering Company, Neponset, Ill.

Filed Sep. 2, 1986, Ser. No. 902,566
Int. Cl.[5] B65G *45/00*
U.S. Cl. 198—497 **14 Claims**

1. A conveyor belt cleaning arrangement including support means positioned to support belt cleaner elements, a sleeve member mounted on said support means and selectively connectable thereto, one or more belt cleaner elements each having a scraping edge at one end thereof for engaging said conveyor belt and each having mounting means at the other end thereof for connecting said element to said sleeve member, wherein said sleeve member is formed of a plastic having a high degree of lubricity and a low sliding coefficient of friction, said sleeve member defining a plastic sliding surface



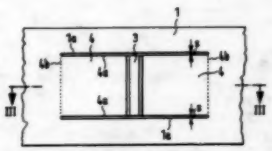
adapted to facilitate removal and replacement of said cleaner elements.

4,953,690

CONVEYOR WITH SLIPPAGE STOPS ON THE CONVEYOR SURFACE

Harry Herzke, Allensteiner, Fed. Rep. of Germany, assignor to Firma Ernst Siegling, Hanover, Fed. Rep. of Germany

Filed Sep. 19, 1989, Ser. No. 409,091
Claims priority, application Japan, Sep. 29, 1988, 3833034
Int. Cl.[5] B65G *15/44*
U.S. Cl. 198—690.2 **3 Claims**



1. A conveyor comprising:

an endless elastic conveyor belt, said belt having a conveyor surface,

guide rollers around which said conveyor belt passes to define a conveying portion and a returning portion of said belt,

support means for supporting said returning portion of said conveyor belt,

a plurality of parallel slits formed in said conveyor belt at longitudinally spaced intervals in the direction of travel of said belt, said slits defining a plurality of longitudinally spaced tongues in said conveyor belt, each of said tongues having

two longitudinal free edges, and

two transverse transition edges at opposite ends of said tongue whereat the tongue merges flush into said belt, and

a plurality of stops spaced longitudinally apart on said conveyor surface for engaging material carried by said conveying portion of said conveyor belt to prevent or halt slippage of said material on said conveying portion, said stops being disposed on said tongues.

4,953,691

CONVEYOR CHAIN AND ATTACHMENTS THEREFOR

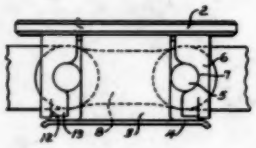
Wolfgang Janzen, Windorf-Obersdorf, Fed. Rep. of Germany, assignor to Flexon Holland, B.V., Amsterdam, Netherlands

Filed Jul. 22, 1988, Ser. No. 222,766

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724354

Int. Cl.[5] B65G 17/14

U.S. Cl. 198—803.01 14 Claims



1. A roller chain conveyor and a detachable top plate assembly therefor, said top plate assembly comprising

top plate base member means,

a plurality of guide plate means, each depending from opposite sides of said base member means so as to overlap roller links of said chain conveyor, the lateral distance between said guide plate means being at least equal to the overall length of connecting pins of said roller links,

at least four resilient spring-like tongue member means, each depending from said opposite sides of said base member means disposed about and separated by a vertical space from each of said guide plate means, each said tongue member means having yieldable contact with side bars of said roller links,

recess means formed in each of said tongue member means, first and second pairs of said recess means having a coincident transverse axis and being adaptable to receive and maintain therein a one of said connecting pins, and

top plate carrying means secured to said top plate base member means.

4,953,692

DRIVE FRAME FOR A SCRAPER CHAIN CONVEYOR

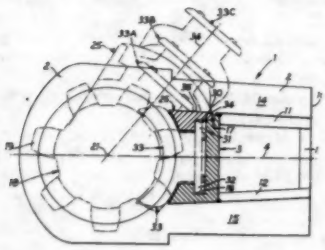
Brian R. Stoppani, Doncaster, and Norman Cummings, Barnsley, both of England, assignors to Gullick Dobson Limited, Wakefield, England

Filed Dec. 14, 1988, Ser. No. 284,102

Claims priority, application United Kingdom, Dec. 18, 1987, 8729508; Apr. 21, 1988, 8809423

Int. Cl.[5] B65G 23/06

U.S. Cl. 198—834 28 Claims



1. A drive frame for a scrapper chain conveyor comprising a pair of spaced-apart parallel sidewalls, a cross-member interconnecting said sidewalls by being welded thereto; a sprocket barrel assembly, at least one sprocket ring provided on said sprocket barrel assembly, at least one endless chain assembly of said conveyor being adapted to engage said at least one sprocket ring; at least one seating surface provided on said sprocket barrel assembly, at least one seating surface provided on the cross-member, said at least one sprocket barrel assembly seating surface and said at least one cross-member seating surface being mutually engageable; at least one abutment face provided on said cross-member; at least one abutment face provided on said sprocket barrel assembly in close but spaced proximity from said cross-member abutment face to define at least one upwardly open pocket; and a releasable fastening means for securing said sprocket barrel assembly to said drive frame via said mutually engageable seating surfaces, that is lowerable into, and raisable from, said at least one pocket, and that is also actuable and accessible from above whereby, after the lowering of said fastening means from above, actuation of said fastening means from above in a first direction, causes said at least one seating surface of said sprocket barrel assembly to be urged into tight seating engagement with said at least one seating surface of said cross-member and hence with said drive frame, and upon actuation of said fastening means again from above, in an opposite direction, causes said sprocket barrel assembly to be released from tight seating engagement with said cross-member and hence with said drive frame, whereupon said fastening means can be lifted from said at least one pocket to provide for access, disassembly and serving.

4,953,693

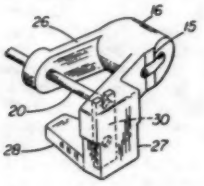
MODULAR LINK CONVEYOR SYSTEM

Jorgen Draebel, Copenhagen, Denmark, assignor to Span Tech Corporation, Glasgow, Ky.

Filed Jan. 23, 1989, Ser. No. 300,829

Int. Cl.[5] B65G 17/06

U.S. Cl. 198—853 27 Claims



1. A modular link conveyor system, comprising:

a plurality of modular links, each link including an apex and two legs extending therefrom, said apex further including a slot passing transversely therethrough, said legs further terminating in a distal end portion, each said end including a hole passing transversely therethrough;

a plurality of transverse connecting means, said connecting means passing through said slots and said holes to engage said modular links together and form a conveyor belt;

conveyor belt guide means;

said modular links including side links formed by the inclusion of a depending arm to said modular links for engaging said conveyor belt guide means, each said side link further including integral locking means for engaging said connecting means, said side links performing the dual function of retaining said connecting means in position and cooperatively engaging said conveyor belt guide means to allow said conveyor belt to traverse a bend; and

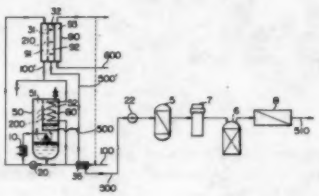
drive means to impart motion to said conveyor.

4,953,694

DISTILLING APPARATUS

Nobuatsu Hayashi, Abiko; Sankichi Takahashi, Hitachi; Katsuya Ebara, Mito; Hideaki Kurokawa; Akira Yamada, both of Hitachi; Yasuo Koseki, Hitachiota; Harumi Matsuzaki, Hitachi, and Hiroaki Yoda, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 942,795, Dec. 17, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 208,212
Claims priority, application Japan, Dec. 18, 1985, 60-282901; Feb. 5, 1986, 61-21938
Int. Cl.[5] B01D *61/00*
U.S. Cl. 202—180 5 Claims



1. A distilling apparatus for producing ultrapure water by condensing vapor generated from raw water, the distilling apparatus comprising:

means for defining a closed cylindrical main distilling body;

raw water tank means formed in said main distilling body for collecting raw water therein;

first heating means for heating and hence degassing the raw water at a pressure approximately equal to atmospheric pressure;

means for feeding the degassed water into the closed cylindrical main distilling body;

second heating means for heating the degassed water fed thereto at a pressure approximately equal to atmospheric pressure;

a hydrophobic porous film means arranged in said closed cylindrical main distilling body so as to divide the same into an evaporation chamber means for generating vapor from the degassed water heated by said second heating means and a condensation chamber means for receiving the vapor from the evaporation chamber means after passing throughout the hydrophobic porous film means into said condensation chamber means;

means disposed in said condensation chamber means for condensing the vapor passed through the hydrophobic porous film means into said condensation chamber means; and

distilled water tank means formed in said condensation chamber means for collecting distilled water from the condensing means.

4. A distilling apparatus for producing ultrapure water from raw water, the distilling apparatus comprising:

main distilling body means separated into an evaporator chamber means and a condensation chamber means, said main distilling body means including a raw water tank in a lower portion of the evaporation chamber means and a distilled water tank in a lower portion of said condensation chamber means;

means for introducing raw water into said evaporator chamber means;

heating means for heating said water being introduced to a temperature above a saturation temperature of said raw water at a pressure approximately equal to atmospheric pressure;

means for generating vapor from said heated raw water introduced to said evaporation chamber means;

a hydrophobic porous film means for allowing said vapor to pass from said evaporation chamber means to said condensation chamber means without allowing liquid to pass from said evaporation chamber means to said condensation chamber means;

means disposed in said condensation chamber means for condensing said vapor in said condensation chamber means such that the vapor becomes distilled water and is collected in said distilled water tank;

a thermobar vaporization means connected with said main distilling body means, said thermobar vaporization means comprising:

raw water chamber means for receiving raw water;

air chamber means located next to said raw water chamber means;

a cooling chamber means located next to said air chamber means;

a hydrophobic porous film means for separating said raw water chamber means and said air chamber means;

a cooling surface separating said air chamber means and said cooling chamber means;

means for feeding raw water from said condensation means to said raw water chamber means; and

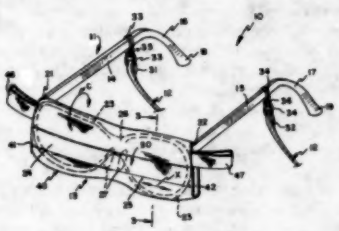
means for feeding raw water from said raw water chamber means to said condensation chamber means.

4,953,695

PROTECTIVE COVER FOR EYEGLASSES

Brett C. Tallman, Lupfer Ave., Box 1261, Whitefish, Mo. 59937

Filed Sep. 22, 1989, Ser. No. 410,785
Int. Cl.[5] B65D *85/38*
U.S. Cl. 206—5 6 Claims



1. The combination of a pair of eyeglasses and a protective cover comprising a pair of eyeglasses defined by a frame front, lenses, bridge, nose pads and temples; a protective cover comprising a generally tubular member having axially opposite open ends, said tubular member being constructed from generally resilient material, said tubular member in a first operative condition of said combination snugly housing therein at least said frame front, lenses, bridge and nose pads, an elongated retainer having opposite ends secured one to each of said temples, and said tubular member in a second operative condition of said combination being in external sliding telescopic relationship to said frame front, temples and elongated retainer whereby said tubular member can be slipped to and from said front frame and to and from said elongated retainer generally along said temples.

4,953,696

DETACHABLE STATIONERY CASE RACK

Tony Huang, No. 165, Tzsiu N. Rd., Chang-Hwa City, Chang-Hwa Hsien, and Johnny Huang, 7F-1, No. 101, Sec. 2, Ho-Ping E. Rd., Taipei, both of Taiwan

Filed Oct. 10, 1989, Ser. No. 419,191
Int. Cl.[5] A45C *11/34*
U.S. Cl. 206—214 3 Claims

1. A detachable stationery case rack, including:

a base cushion having ring-shaped body comprising raised

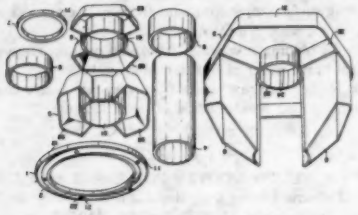
side-wall, and a plurality of bottom legs covered with elastic material;

a circular packing having an outer diameter slightly smaller than said base cushion and comprising a plurality of holes made thereon for insertion therein of equal number of balls respectively to permit rotating against said base cushion when it is mounted thereon;

a bottom case being an equilateral polygonal case divided by division walls into several compartments and comprising hollow shaft raised from the bottom in the center;

a central column having a tubular structure specially arranged in shape and size suitable for insertion into said hollow shaft of said bottom case;

a middle rack comprising a central hollow collar with lateral cases extending therefrom, which central hollow collar



being arranged in size suitable for insertion therethrough of said central column;

an upper rack comprising a central hollow collar with lateral cases extending therefrom, which central hollow collar being arranged in size suitable for insertion therethrough of said central column;

an upper cap being a ring-shaped cap comprising inner circular wall specially arranged in size for insertion into said central column to let the upper cap be firmly secured thereto; and

two side cases being bottom enclosed cases having a section matching with the compartments of said bottom case in which they stand, and said central column, said middle rack and said upper rack, of which the height does not exceed by said central column.

4,953,697

SELF-RETAINING GOLF BAG COVER EMPLOYING PLAIN SLEEVE

Jack M. Stanley, 6989 Polvadero Dr., San Jose, Calif. 95119

Filed Sep. 15, 1989, Ser. No. 407,910
Int. Cl.[5] A63B *55/00*; B65D *65/02*
U.S. Cl. 206—315.400 **2 Claims**

1. A covered container comprising a container and a cover for protecting objects in said container comprising:

(a) a container, said container comprising a golf bag having a plurality of golf clubs in said bag, said bag having an open top end through which said clubs can be removed from said bag, said cover being positioned over said open top end of said bag,

(b) a cover comprising a tubular sleeve of flexible material for slipping over and surrounding at least a top part of said container, said sleeve having a loose, open bottom that is plain, continuous, smooth, imperforate, and free of any fastening means or discontinuity,

(c) said sleeve having a drawcord mounted in a top portion thereof so that said top can be opened and closed by means of said drawcord so as to provide access to the top of said container or cover the top of said container,

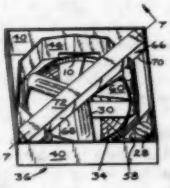
(d) said cover having a uniform diameter of about 46 centimeters, a length of about 66 centimeters, and a thickness of about 100 microns.

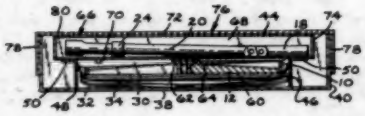
4,953,698

UNITARY CARTON SYSTEM FOR FANS

Daniel A. Gregorich, and Frank E. Breining, both of Jackson, Mich., assignors to Airmaster Fan Company, Jackson, Mich.

Filed Feb. 14, 1990, Ser. No. 487,456
Int. Cl.[5] B65D *85/68*
U.S. Cl. 206—319 **10 Claims**





1. A unitary carton system for shipping a floor mounted fan consisting of a column supporting base, an elongated column, an electric motor, a fan blade assembly, and a pair of nestable blade guards each having concave and convex sides comprising, in combination, a rectangular carton having a closed bottom panel, side walls and an open upper end, intersecting side walls defining first and second pairs of opposed interior corner regions, an interior central region defined on said closed bottom panel receiving the blade guards wherein the blade guards are nested within each other such that the convex side of the blade guards is disposed toward said bottom panel and the concave side of the blade guards is disposed toward said carton open end, the column supporting base being received within the nested blade guards located adjacent the concave side of the blade guard closest to said carton open end, the fan blade assembly being located adjacent the base intermediate the base and said carton open end, column structure supporting means defined within said carton extending from said bottom panel

and located between the nested blade guards and said carton side walls, column structure supporting ledges defined on said column structure supporting means adjacent said first pair of opposed corner regions whereby column structure supported on said ledges is diagonally oriented within said carton, said ledges being spaced from said bottom panel a distance whereby column structure supported upon said ledges is closely superimposed over the blade assembly, motor receiving and confining means defined in one of said second pairs of corner regions receiving a motor therein, and means maintaining said column structure upon said column structure supporting ledges whereby said column structure maintains the blade guards, base and blade assembly in the aforedescribed stacked relationship during shipping.

9. A unitary carton system for shipping a floor mounted fan consisting of a column supporting base, an elongated column, an electric motor, a fan blade assembly, and a pair of nestable blade guards each having concave and convex sides comprising, in combination, a rectangular carton having a closed bottom panel, side walls and an open upper end, intersecting side walls defining first and second pairs of opposed interior corner regions, an interior central region defined on said closed bottom panel receiving the nested blade guards, column supporting base and blade assembly in a stacked relationship, motor receiving and confining means defined in one of said interior corner regions, column structure supporting means defined within said carton, column structure supported upon said supporting means superimposed over the stacked blade guards, base and blade assembly in contiguous relationship thereto and means maintaining said column structure upon said supporting means whereby said column structure and stacked components will be retained during shipping.

4,953,699

TAPE STRUCTURE PROVIDED WITH ELECTRONIC COMPONENTS

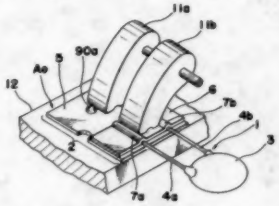
Akira Mohri, and Toshikazu Kato, both of Fukui, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 20, 1985, Ser. No. 811,664

Claims priority, application Japan, Dec. 24, 1984, 59-200905[U]

Int. Cl.[5] B65D *73/02*

U.S. Cl. 206—330 **9 Claims**



1. A tape structure having first and second half sides defined therein and being provided with electronic components each having one or more terminal legs, for supplying the components to an automatic component mounting machine having at least one pressing arm for pressing at least the second half side of the tape structure, the tape structure comprising:

(a) a base tape having a width;

(b) an attachment tape having a width which is approximately half the width of said base tape, said attachment tape extending parallel to and along said first half side of said base tape;

said base tape and said attachment tape being bonded together so as to support said terminal legs of said electronic components between said base tape and said attachment tape and thereby defining corrugations in said attachment tape where said terminal legs are located; and

(c) projection means provided on said second half side of said base tape, said projection means being configured and located for engaging the pressing arm so as to prevent rotation of the tape structure while said tape structure is pressed by said pressing arm.

4,953,700

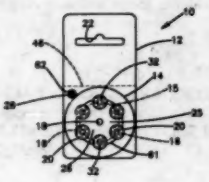
DISPLAY CARD FOR A BATTERY PACKAGE

Jeffery L. DeDino, Kirtland, Ohio, assignor to The Shelby Paper Box Company, Canterbury, Ohio

Filed Feb. 7, 1990, Ser. No. 477,248

Int. Cl.[5] B65D *73/00*

U.S. Cl. 206—333 **16 Claims**



1. An apparatus for supporting a plurality of batteries for movement in a circular path and for enabling electrical testing of each of the plurality of batteries, said apparatus comprising:

a first panel having a conductive surface thereon;

a second panel overlying said conductive surface of said first panel and having a non-conductive outer surface thereon and having a first opening extending therethrough to expose a portion of said conductive surface of said first panel, said first opening in said second panel being located relative to the circular path through which the batteries move so that at least one of the plurality of batteries in the circular path is partly in contact with said portion of said conductive surface and partly in contact with said non-conductive surface; and

thereby enabling electrical testing of the one battery by a first test probe which engages the one battery and a second test probe which engages said conductive surface of said first panel.

4,953,701

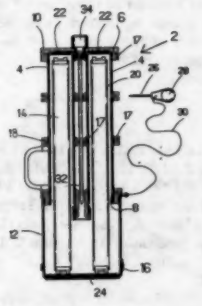
FLUORESCENT TUBE CARRIER

Paul T. Maddock, 943 Raymo Rd., Windsor, Ontario, Canada N8Y 4A7

Filed Aug. 16, 1989, Ser. No. 394,532

Int. Cl.[5] B65D *85/42*

U.S. Cl. 206—419 **11 Claims**



1. For use with a plurality of fluorescent tubes, a carrier for

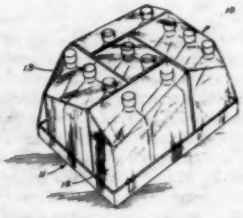
transporting or disposing of said tubes, said carrier comprising a plurality of capsules, one for each tube desired to be carried, each capsule having two ends, at least one end of each capsule being at least partially closed by a cover, the cover of said at least one end of each capsule being removable so that said end can be opened, with means on said carrier for breaking independently, if desired, the tube located in any particular capsule while not breaking, if desired, the tubes in other capsules, all of said capsules being held in a fixed relationship to one another by a plurality of spacers located along the length of the capsules, each spacer having openings for each of the capsules, said carrier having a rod that is long enough to force pieces of a broken fluorescent tube to an area of the carrier where the pieces can be disposed of, each spacer having an additional opening that provides a location for storing said rod on the carrier.

4,953,702

STACKER DEVICE FOR A PACKAGE

Robert M. Bryan, P.O. Box 35664, Minneapolis, Minn. 55435

Filed Sep. 1, 1989, Ser. No. 402,223
Int. Cl.[5] B65D *71/08, 5/48, 21/02*
U.S. Cl. 206—432 **18 Claims**



1. A stacker device for a package of a plurality of identical plastic or paper containers supported in a tray or box, said device comprising:

(A) a first rectangular segment of stiff sheet material having a relatively narrow end section, a center section and a relatively wider end section connected along parallel vertically extending fold lines, the width of said sheet material being at least equal to the height of the plastic or paper containers to be packaged,

(B) a second rectangular segment of stiff sheet material similar to said first segment,

(C) a third and fourth rectangular segment of stiff sheet material, the height of said segments being the same as the height of said first and second segments,

(D) first and second laminated joints between the inner surfaces of each of the narrow end sections of said first and second segments and the outermost edge surface of the wider end sections of the other of said segments, and

(E) third and fourth laminated joints between the outer surface of each of the center sections of said first and second segments and one end of one of said third and fourth segments.

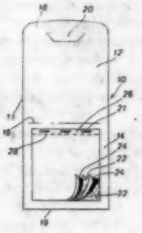
4,953,703

ANTIBACTERIAL PROTECTIVE ELEMENT FOR MICROPHONES AND TELEPHONE RECEIVERS, AND PACKAGE CONTAINING SAID ELEMENT

Lerza Virginio, Via Vespucci 75, 10129 Turin, Italy

Filed May 18, 1989, Ser. No. 353,721
Claims priority, application Italy, Jun. 1, 1988, 67506 A/88
Int. Cl.[5] B65B *75/00*
U.S. Cl. 206—451 **5 Claims**

1. A package of antibacterial protective elements for microphones and telephone receivers, comprising a plurality of antibacterial protective elements each of which is formed of a flexible non-perforated self-adhering thermoplastic film of a size substantially corresponding to that of the microphones and telephone receivers, and a plurality of anti-adhesive separating sheets interposed between said antibacterial protective elements to form a stack therewith and prevent them from adhering to each other; a foldable cover enclosing said stack; and



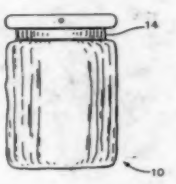
retaining means, said antibacterial protective elements and said separating sheets being all secured along one side thereof by said retaining means to said cover inside thereof, said cover being formed of a pair of leaves, one of said leaves being provided with flexible closure means.

4,953,704

PLASTIC TRASH BAG

Alfred J. Cortese, 5615 Redwood St., San Diego, Calif. 92105

Filed Mar. 13, 1989, Ser. No. 323,542
Int. Cl.[5] B65D *33/30*
U.S. Cl. 206—493 **3 Claims**



1. An improved trash bag comprising:

a trash bag formed from thin sheet plastic material, said trash bag having a closed bottom end, lateral side walls, and an open top end that defines a top edge;

elastic means secured to said trash bag adjacent its top edge that automatically gathers said top edge inwardly thereby closing its top end, said elastic means being easily stretched to open the top end of said trash bag to provide access to its interior; and

said trash bag being mounted on a display board formed of a planar sheet of material having a top edge, laterally spaced side edges and a bottom edge, an aperture is formed adjacent said top edge for hanging said display board, said display board being inserted into the interior of said trash bag and its elastic means gripping the side edges of said display board adjacent its top end to hold it thereon.

4,953,705

PACKAGE HAVING DETENT-ENGAGED CUSHIONING LINING

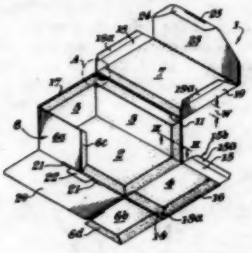
David L. Evamy, Goring-by-Sea, England, assignor to Psychopax Limited, Worthing, England

Filed Jan. 23, 1989, Ser. No. 298,928

Claims priority, application United Kingdom, Jan. 22, 1988, 881393

Int. Cl.[5] B65D *81/10*

U.S. Cl. 206—594 20 Claims



1. A package comprising an outer container formed of sheet material and an inner lining formed of a cushioning material, the package including at least one elongate slot having an open entrance and two longitudinal side faces, a first longitudinal side face of the said at least one slot being defined by the sheet material of the outer container and a second longitudinal side face of the said at least one slot being defined by the cushioning material of the inner lining, the said second longitudinal side face including an abutment surface oriented substantially perpendicularly to the plane of the said first side surface of the said at least one slot and facing away from the said entrance of the said at least one slot, and the said outer container including a tab formed from the said sheet material of the outer container and having a detent, the said tab being capable of entering said at least one slot through said entrance to a position in which said detent engages said abutment surface to resist withdrawal of said tab from said at least one slot.

4,953,706

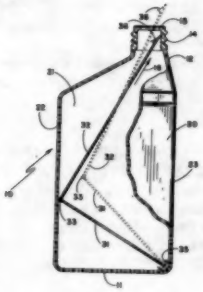
MECHANICAL OIL CAN SEAL BREAKER

Don Piccard, 1445 East River Rd., Minneapolis, Minn. 55414

Filed Nov. 17, 1989, Ser. No. 437,756

Int. Cl.[5] B65D *3/26*

U.S. Cl. 206—603 2 Claims



1. In combination with a container having a generally cylindrical configuration with a bottom wall, a circular spout-like top with a closure cap adapted to be threadably engaged about a planar annular seal surface therearound and with said container including flexible side panels with a front panel, rear panel and end panels depending from said top and joining with said bottom wall, a closure film forming a secondary seal with said planar annular seal surface and being adhesively bonded to the surface of said annular seal surface, and means disposed within said container for achieving perforation of said closure film forming said secondary seal upon innerdeflection of said flexible end panels:

(a) said seal film perforation means comprising first and second elongated rod members pivotally joined together at an apex in generally right angular relationship, one to the other;

(b) said first rod member having an anvil means coupled to the free tip thereof and with said anvil being normally disposed generally at the juncture between one of said end panels and the bottom closure wall;

(c) said second rod member having a cutter blade coupled to the free tip end thereof and with said cutter blade being normally disposed along the interior of said spout-like tip adjacent to the innersurface of said closure film;

(d) the arrangement being such that upon the application of inwardly directed pressure to said end panels sufficient for inward deflection thereof, the angular relationship between said first and second elongated rod at said apex increases to cause outward movement of said second rod member to force said cutter blade to move more outwardly of said spout and perforate said closure film.

4,953,707

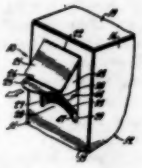
BOX WITH POURING SPOUT

Sam Wein, 5061 Aegina Way, Oceanside, Calif. 92056

Filed Jul. 3, 1989, Ser. No. 374,739

Int. Cl.[5] B65D *5/54*

U.S. Cl. 206—621.4 23 Claims



1. A box having a pouring spout comprising

a cardboard structure defining a container having two side panels, a top panel, a bottom panel and two end panels,

one of said panels including a first outer layer and a second layer inwardly of said first layer,

said first layer including a first flap pivotal about one edge thereof

said second layer including a second flap pivotal about one edge thereof,

said second flap including means for permitting bending of said second flap at a location spaced from said one edge thereof,

said first flap overlying and being secured to said second flap between said one edge of said second flap and said location,

said structure including a third layer inwardly of said second layer, said first layer including a portion overlying a portion of said second flap,

said third layer having an opening covered by said second flap,

whereby to achieve an open position, said first flap is pivoted about said one edge thereof, said second flap is caused to pivot about said one edge of said second flap, said second flap is bent at said location, said portion of said second flap is withdrawn from said portion of said first layer overlying the same, and said opening in said

third layer is uncovered to permit dispensing through said opening in said third layer.

4,953,708

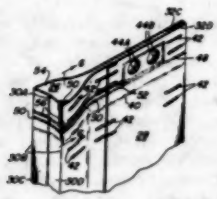
FLEXIBLE PACKAGE WITH POUR SPOUT AND HANDLE

Jeffrey S. Beer, Perkiomenville; Michael D. Gracie, Sr., Kennett Square, and Tullio U. Vigano, Gwynedd Valley, all of Pa., assignors to Fes-co System USA, Inc., Telford, Pa.

Filed Aug. 23, 1989, Ser. No. 398,204

Int. Cl.[5] B65B *33/10, 33/20, 33/22, 33/38*

U.S. Cl. 206—632 **9 Claims**



1. A flexible tubular package having a longitudinal axis and formed from flexible sheet material, said package comprising first and second panels disposed opposite each other and connected on laterally opposite sides thereof, said package having a sealed lower end portion and an upper end portion terminating in a free edge, said upper end portion of said package being folded over itself along a transverse fold line to form a flap with the portion of said first panel between said free edge and said fold line abutting the contiguous portion of said first panel below said fold line, said abutting portions being releasably secured to each other by first releasably securable adhesive means interposed therebetween, said flap including at least one opening extending through said first and second panels to form a handle for said package, a first seal line extending transversely across said panels adjacent said fold line from one of said sides to an intermediate point, a second seal line extending transversely across said panels adjacent said fold line from said intermediate point to the other of said sides, said first seal line permanently sealing said first and second panels together therealong, said second seal line being peelable for releasably sealing said first and second panels together therealong, said first releasably securable adhesive means being peelable to enable said flap to be unfolded to provide access to said second seal line, whereupon said second seal line can be peeled apart to form a pour spout for said package.

4,953,709

MULTI-STAGE MEANS FOR SORTING MIXTURES OF SOLID MATERIALS

Haas Kaufmann, Flaesheim, Fed. Rep. of Germany, assignor to Kaufmann GmbH, Flaesheim, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,311

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3813990

Int. Cl.[5] B03B *7/00, 9/00*

U.S. Cl. 209—44 **10 Claims**

1. A multi-stage apparatus for sorting a mixture of solid materials into lightweight and heavy materials, with said mixture having lumpy, granular, and pulverous constituents of differing specific gravity, and being, for example, mixtures of coal and mine waste or ore and refined ore, said apparatus comprising:

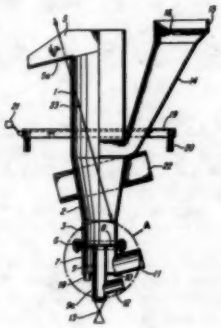
a slim, upright container for receiving said material that is to be sorted, with said container comprising a cylindrical upper portion, a central downwardly tapering conical portion, and a cylindrical lower portion, with said entire container being mounted for vibration on resilient support element means;

vibrator means for vibrating said container in a linear manner along an axis that extends essentially transverse to the horizontal;

an upwardly extending feed chute, with said upper container portion having a top end, and a bottom end that is provided with an opening to which said feed chute is connected, said feed chute being provided with a feed hopper that is disposed at the level of said top end of said upper container portion;

a discharge channel for lightweight material disposed on said top end of said upper container portion;

a collecting container secured to said lower container portion via a flange connection that has a plane of separation, with said collecting container having a base remote from said flange connection;



a tubular member that extends centrally through said collecting container, with said tubular member having a top end, and remote therefrom a part that extends downwardly beyond said base of said collecting container and forms a bottom end of said tubular member;

an annular screen that is secured in said plane of separation of said flange connection and through which extends said top end of said tubular member to communicate with said lower container portion;

a controllable closure means provided at said bottom end of said tubular member;

a first upwardly extending air supply tube connected to and communicating with said collecting container;

a second upwardly extending air supply tube connected to and communicating with said downwardly extending part of said tubular member; and

a short pipe attached to said base of said collecting container for the discharge of fine material therefrom.

4,953,710

AUTOMATED APPARATUS FOR INSPECTING COLUMNAR BODIES BY EDDY CURRENT METHOD

Chung-Mei Chen; Jenn Fu Yang; Weng-Jay Lee; Tsai-Sheng Lin, and Yung-Hsing Tsay, all of Kaohsiung, Taiwan, assignors to China Steel Corporation, Taiwan

Filed Dec. 21, 1988, Ser. No. 287,022

Int. Cl.[5] B07C *5/00, 5/344, 5/38*

U.S. Cl. 209—518 **8 Claims**

1. An automated apparatus for inspecting columnar bodies by an eddy current method, comprising:

a stockup zone for storing a plurality of columnar bodies, said stockup zone being provided with feed means for feeding out each of the plurality of columnar bodies one by one;

a feed zone disposed near said stockup zone for receiving the columnar bodies fed from said stockup zone, said feed

zone being provided with transfer means for transferring the columnar bodies;

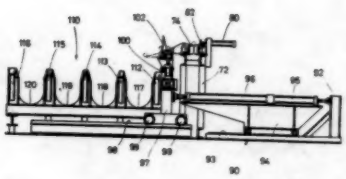
eddy current inspection means disposed downstream of said feed zone and in alignment with said feed zone;

guide means disposed between said feed zone and said eddy current inspection means for receiving the columnar bodies fed from said feed zone and guiding the columnar bodies to be inspected into said eddy current means in a proper manner;

computer means coupled to said eddy current inspection means for sampling the signals generated by said eddy current inspection means for each predetermined distance travelled by the columnar bodies and processing the signals sampled to estimate the classes of the columnar bodies inspected and subsequently sending out class signals in accordance with the estimate of the classes;

a discharge zone disposed downstream of said eddy current inspection means for the columnar bodies coming out from said eddy current inspection means, said discharge zone being provided with push means for discharging said columnar bodies from said discharge zone;

a distribution zone disposed near said discharge zone, said distribution zone being provided with distribution means and a plurality of storage areas; and



control means respectively coupled to said stockup zone, said feed zone, said eddy current inspection means, said guide means, said computer means, said discharge zone and said distribution zone for controlling said feed means to feed each of the plurality of columnar bodies into said feed zone one by one at a proper timing;

said control means further controlling said transfer means to transfer the columnar bodies toward said eddy current inspection means and to conduct the leading end portion of a following columnar body to urge the trailing end portion of a leading columnar body so as to impel the columnar bodies though said eddy current inspection means to reach said discharge zone, controlling said push means to push the columnar body in said discharge zone onto said distribution means, responding to the class signals sent from said computer means to enable said distribution means to allocate the columnar body on said distribution means into one of said storage areas;

said distribution means including a carriage and a first actuation means coupled to said carriage and to said control means and enabled by said control means to move said carriage among the storage areas.

4,953,711

METHOD AND DEVICE FOR ELIMINATING IMPERFECT CIGARETTES IN CONNECTION WITH A CIGARETTE PACKAGING MACHINE

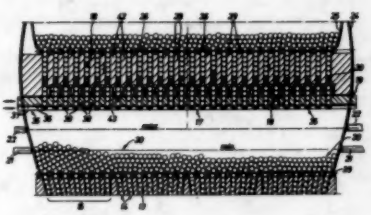
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 60,887, Jun. 12, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 330,922

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620735

Int. Cl.[5] B07C 5/00

U.S. Cl. 209—535 **5 Claims**



1. A cigarette magazine (12) comprising:

a plurality of vertical magazine chutes (13) for vertically conveying a plurality of vertical columns (14) of horizontally disposed, elongated cigarettes whose longitudinal dimensions lie in a horizontal plane, and for forming and discharging groups of the cigarettes; and

a testing unit means (17) integral with said magazine and located vertically above said magazine chutes (13) and extending horizontally through the cigarette magazine (12) for detecting and separating out defective from non-defective cigarettes;

wherein said testing unit means (17) comprises:

for the purpose of accommodating a plurality of vertical test columns (26) of cigarettes (11), a plurality of respective vertical, straight-walled, parallel test chutes (28) which are defined by a plurality of parallel, horizontally spaced, vertical dividing walls (42) and which correspond in number to the number of said magazine chutes (13);

at least two testing means (30), associated with each test chute (28), for simultaneously testing two cigarettes (11), disposed one on top of another, in each test chute;

cigarette delivery and discharge means (35) located underneath said test chutes (28) in a region in which tested defective cigarettes are ejected from the magazine in the direction of their longitudinal dimension and in which tested, non-defective cigarettes are released downwards inside the magazine (12), said cigarette delivery and discharge means (35) comprising only first and second movable guiding and supporting cog plate means (36 and 37) which are disposed in, and are movable relative to one another and relative to said test chutes (28) in, respective vertically spaced horizontal planes so that said first cog plate means (36) is above said second cog plate means (37);

said first cog plate means (36) being disposed immediately underneath said test chutes (28) and having vertically extending cog webs (38) with the same horizontal spacing as that of said dividing walls (42); said cog webs (38) havin a test position in which said cog webs (38) are vertically aligned with said test chutes (28) for supporting respective said test columns (26) and retaining two previously received and tested cigarettes between adjacent cog webs (38) during testing of the cigarettes in said test chutes (28); and said cog webs (38) having an initial position in which said cog webs (38) are vertically aligned with said dividing walls (42) for receiving said two previously tested cigarettes at a time between adjacent cog webs (38);

said second cog plate means (37) having support webs (39), with the same horizontal spacing as said cog webs (38),

disposed in vertical alignment with said dividing walls (42) in said test position for supporting each two cigarettes received between adjacent cog webs (38), said support webs (39) being disposed in a delivery position in vertical alignment with said test chutes (28) and said cog webs (38);

means (46) for horizontally shifting said second cog plate means (37) one half the distance of said horizontal spacing from said test position to said delivery position, while said first cog plate means (36) is in said test position and after the ejection of defective cigarettes, so that tested non-defective cigarettes are vertically discharged through said cog webs (38) and said support webs (39), said cog webs (38) being vertically dimensioned to accommodate two cigarettes simultaneously tested in each test chute (28) by said testing means (30);

means (45) for horizontally shifting, while said second cog plate means (37) is in said delivery position and after vertical discharge of the non-defective cigarettes, said first cog plate means (36) from said test position to said initial position to receive previously tested cigarettes which are retained between adjacent cog webs (38) and which are supported by said support webs (39); and

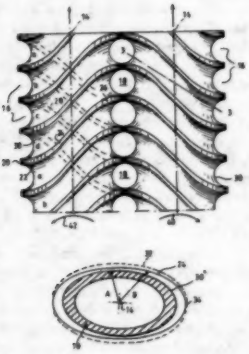
means (45, 46) for horizontally shifting said first (36) and said second (37) cog plate means to said test position.

4,953,712

GRADING ROLLS FOR AGRICULTURAL, HORTICULTURAL AND OTHER ARTICLES

Jacobus Meester, Andijk, Netherlands, assignor to TS AGRO Products IM-Export B.V., Hendrik-Ido-Ambacht, Netherlands

Filed Mar. 10, 1989, Ser. No. 321,963
Int. Cl.[5] B07B *13/04*
U.S. Cl. 209—669 **7 Claims**



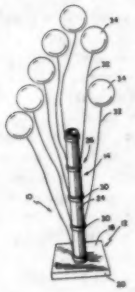
1. Grading apparatus for agricultural, horticultural, and other articles, comprising a pair of cooperating, parallel and horizontally arranged substantially cylindrical rolls, the surface of each of said rolls having a plurality of parallel and helically encircling closed sinuous grooves, said grooves being in succession and being spaced from each other along the axis of the roll, and having surface edge portions between adjacent grooves undulating in radial distance from the roll axis, said paired rolls being mirror images of each other, arranged side by side to be rotated with equal rotational velocity and with corresponding surface edge portions placed in facing opposition to each other such that the paired rolls move away from each other at their tops and form a series of apertures between the facing grooves for the passage of articles of equal or lesser size than said grooves, said surface edge portions between the grooves coating to provide for the transfer axially of the articles of greater size from one groove to the next.

4,953,713

BALLOON POSITIONING DEVICE

Barry M. Yaffe, 15200 Hannans Way, Rockville, Md. 20853

Continuation of Ser. No. 130,518, Dec. 8, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,066
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—13 **5 Claims**



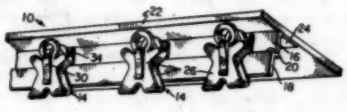
1. In combination, a balloon positioning device for positioning balloons in tiers in a cluster in which the tiers are oriented at different vertical elevations, and a plurality of balloons having substantially equal length ribbons attached thereto, said device comprising a generally vertically disposed support member, a plurality of attachment points on said support member in predetermined vertically spaced relation corresponding to the difference in vertical elevation of the tiers of balloons whereby balloons attached to the attachment points are positioned at different elevations to form a balloon cluster in which the tiers of balloons are at different elevations.

4,953,714

BOOT HANGING DEVICES

Stanley M. Paul, Greenwich, Conn., assignor to Paul Associates, Inc., Long Island, N.Y.

Filed Jan. 29, 1990, Ser. No. 472,331
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—36 **7 Claims**



1. A device for hanging articles of clothing such as footwear, comprising:

a mounting bar adapted to be attached to a supporting surface, said mounting bar having a metallic contact surface and a generally horizontal flange, said flange defining an upwardly directed supporting face;

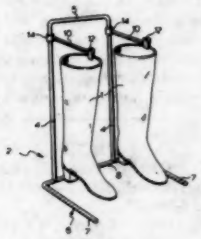
a clip for securing said article to said mounting bar, said clip comprising means for grasping said article and a magnet for selectively coupling with said metallic contact surface, said magnet being supported by said upwardly directed supporting face so that said magnet is prevented from sliding off said metallic contact surface due to the weight of said article.

4,953,715

BOOT SUPPORT

Giuliano Celli, 95 Wakelin Ct., Woodbridge, Ontario, Canada L4L 1A9

Filed Aug. 4, 1989, Ser. No. 389,415
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—37 17 Claims



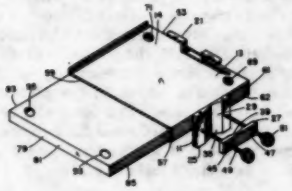
1. A boot support comprising a base, an upright portion extending generally perpendicular to the base adjacent one edge of said base and a cantilevered arm slidable on said upright portion at one end of said arm and biased by gravity to lock with said upright portion under the influence of the weight of said arm, said arm at an end remote from said upright portion including a releasable clip means adapted to engage a boot at the top thereof and have sufficient gripping force to maintain two boots suspended from the clip means, and two upright portions spaced from one another and joined at the upper end to be integral, said upright portions being angled slightly from the vertical rearwardly away from said base with each upright including a single cantilevered arm.

4,953,716

ACCESSORY TRAY

Mitchell Rapoport, Box 324, Woodstock, N.Y. 12498

Filed Jan. 31, 1989, Ser. No. 304,321
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—107 4 Claims



1. An accessory tray for use when clamped to a pole, such as the neck of a tripod, to provide a work surface area for holding accessories, such accessory tray comprising:

a fixed-tray section having a surface area of substantially rectangular shape with four corners and with a near side edge, a far-side edge, a rear edge and a front edge, said rear edge; near-side edge and far-side edge, having an apron with a lower edge extending downwardly substantially at right angles from the fixed surface area, the lower edge of the apron along the near-side edge and the far-side edge bending upwardly to form a V-shaped groove, said fixed-tray section having a pair of access openings through the surface area thereof, one access opening being located in the corner formed by the near-side edge and the rear edge and another access opening being located in the corner formed by the far-side edge and the rear edge;

a clamping means affixed to the near-side edge of the fixed-tray section, said clamping means including an inner section with a pair of openings and thread means and an outer section with a pair of openings and with a pair of threaded bolts slidably engaging the outer section and engaging the thread means of the inner section;

a sliding-tray section having a surface area of substantially rectangular shape with four corners and with a near-side edge, a far-side edge, a rear edge and a front edge, said front edge, near-side edge and far side edge having an apron extending downwardly, substantially at right angles from the surface area of the sliding tray section, said sliding tray section having a pair of access openings through the surface area thereof, one access opening being located in the corner formed by the near-side edge and front edge and another access opening being located in the corner formed by the far side edge and the front edge; the apron on the far side edge and the near side edge of the sliding tray section being slidably mounted in the V-groove of the fixed tray section;

means mounted on the sliding tray section and the fixed tray section to limit the extent to which the sliding tray section can be extended from the fixed tray section;

an anchor affixed to the surface area of the fixed tray section along the rear edge thereof substantially midway between the two access openings in the fixed tray section for holding utility lines and to prevent accessories from sliding off the rear edge of the fixed-tray section and;

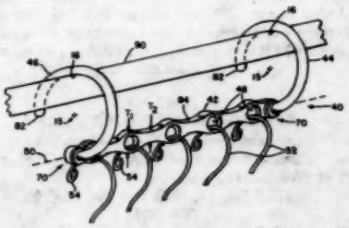
a support means connected to the clamping means and the apron on the far side edge of the fixed tray section.

4,953,717

HINGED MULTIPLE GARMENT HANGER

Wilhelm Rösch, Hinzbecker Höhe 30, Essen 15, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 360,886, May 24, 1989. This application Aug. 3, 1989, Ser. No. 389,124
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—113 7 Claims



1. An improved multiple garment hanging device for simultaneously hanging and storing several articles of clothing or the like on a clothes hanger rod, said garment hanging device being of the type which includes a rigid bar, said rigid bar having a plurality of holes extending therethrough for the receipt of clothes hanging elements therein, a pair of hooks pivotably mounted at opposite ends of said rigid bar, said pair of hooks being substantially alignable toward each other for being held by a human hand for supporting the garment hanging device at least during insertion of the clothes hanging elements in said holes of said rigid bar, said improvement comprising:

said rigid bar having a central plane and a longitudinal axis lying within said central plane;

said plurality of holes in said rigid bar being separated one from the other and displaced substantially along said longitudinal axis;

each of said holes extending substantially perpendicular to said central plane;

said rigid bar having a first transverse dimension within said central plane, said first transverse dimension being perpendicular to said longitudinal axis at each of said holes;

said rigid bar having a second transverse dimension within said central plane, said second transverse dimension being perpendicular to said longitudinal axis in an area thereof between said holes;

said first transverse dimension being greater than said second transverse dimension;

said rigid bar having a pivot hole at each of said opposite ends thereof; said pivot hole extending substantially perpendicular to said central plane;

each of said pair of hooks lying substantially along a circle, said circle having a center;

said each of said pair of hooks extending along a substantial portion of said circle to have a free end and a pivot end;

said pivot end of said hook having a pivot axis;

said circle having a portion being substantially adjacent to said pivot axis;

said pivot axis being substantially tangential to said portion of said circle;

said pivot axis being disposed within said pivot hole of said rigid bar with said center of said circle of said hook being located within said central plane of said rigid bar during relative rotation of said pivot axis within said pivot hole;

said hook having a first bearing member substantially at one side of said pivot axis and a second bearing member substantially at the other side of said pivot axis;

said rigid bar having a first side and a second side which are substantially parallel with the central plane;

said first bearing member including an annular surface substantially perpendicular to said pivot axis for bearing against said first side of said rigid bar at said pivot hole;

said second bearing member being disposed against at least a portion of said second side of said rigid bar at said pivot hole;

said pivot axis including slot means at said second bearing member for biased inward deflection of said second bearing member for having provided means for inward deflection of said second bearing member during insertion of said pivot axis in said pivot hole during assembly; and

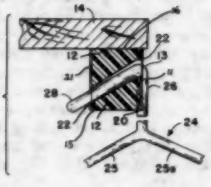
said central plane for extending vertically below the clothes hanger rod when both of said hooks are engaged with the clothes hanger rod and said central plane for extending vertically below the clothes hanger rod when only one of said hooks is engaged with the clothes hanger rod.

4,953,718

CLOTHES HANGING ASSEMBLY

James C. Graff, and Frederick K. Robertson, both of Williamsburg, Va., assignors to Paul B. Austin and Charles J. Graff, both of Williamsburg, Va.

Filed Jun. 14, 1989, Ser. No. 365,796
Int. Cl.[5] A47H *1/00*
U.S. Cl. 211—123 **9 Claims**



1. A clothes hanging assembly comprising in combination:

a clothes hanger support bar having a top surface, a bottom surface and a first and a second side surface,

a plurality of spaced, vertically extending, grooves extending from said bottom surface along said first side surface to a point thereon short of said top surface,

each said vertically extending groove merging with an angularly directed through opening leading from said first side surface downwardly through said second side surface at a point short of said bottom surface.

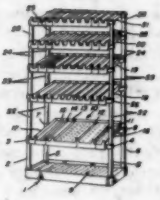
a plurality of clothes hangers, each having a vertical section thereon received by one of said vertically extending grooves and a hook section extending from said vertical section at an acute angle thereto and mating with, and releasably retained by, said angularly directed through opening to thereby permit hanging of clothes on said hanger in spaced adjacency relative to each other while preventing relative horizontal movement thereof.

4,953,719

ARTICLE ORGANIZER DISPLAY UNIT

William S. Spamer, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 3, 1989, Ser. No. 416,345
Int. Cl.[5] A47F *43/00*
U.S. Cl. 211—188 **8 Claims**



1. An article organizer display unit comprising a stack of at least two vertically spaced shelves, a plurality of sockets each having a mounting bracket including a base plate, a cradle structure and a tubular cavity, said cradle structure having a pair of support arms secured respectively to opposite ends of said base plate and arranged in enveloping relation to said tubular cavity, some of said sockets being arranged with their mounting brackets secured about the periphery of one of said shelves and others of said sockets being arranged with their mounting brackets secured about the periphery of the other of said shelves, and a plurality of vertically disposed tubular posts arranged with their ends in engagement with the tubular cavities of the sockets associated with one shelf and the shelf immediately above said one shelf and determining the vertical space therebetween, the axes of the tubular cavities associated with at least one of said shelves being perpendicular to the plane of said one shelf and the axes of the tubular cavities associated with at least one other of said shelves being disposed at an acute angle to the plate of said one other shelf.

4,953,720

CRANE AND METHOD FOR USING CRANE

Tadashi Okano, and Tadayoshi Honda, both of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,950
Claims priority, application Japan, Oct. 21, 1988, 63-265855
Int. Cl.[5] B66C *23/34*
U.S. Cl. 212—176 **7 Claims**

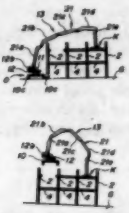
1. A crane for conveying construction elements comprising:

(a) a base;

(b) a driving body for driving and controlling the crane disposed on the base rotatable in a horizontal plane;

(c) an articulated arm attached to the driving body pivotable in a vertical plane, the arm being folded and extended in a vertical plane;

(d) a clutching means for clutching the construction elements, the clutching means being tiltably and detachably connected to a forward end of the arm; and



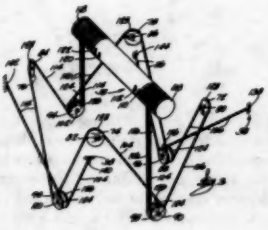
(e) a fixing means tiltably and detachably connected to the forward end of the arm as a substitute for the clutching means, the fixing means being capable of being fixed to the construction, whereby the driving body can be moved while the fixing means is fixed to the construction.

4,953,721

ANTI-SWAY CRANE REEVING APPARATUS

Vilem Foit, Greenfield, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Dec. 9, 1988, Ser. No. 281,590
Int. Cl.[5] B66C *13/06*
U.S. Cl. 212—147 **15 Claims**



1. A reeving apparatus for a crane having an overhead frame, winding drum means mounted on the frame, and a lifting beam positioned below the frame and subject to saying forces and movement transverse to the vertical comprising:

a plurality of spaced-apart rotatable sheaves affixed to the lifting beam, each of said sheaves having first and second grooves; and

a plurality of rope means affixed to the drum means and overhead frame and wrapped around the sheaves for supporting the lifting beam, each of the plurality of rope means including *a pair of* first and second rope means, *the first and second rope means* both extending to and [wrapped] *wrapping* around a different one of the *plurality of* sheaves respectively in the first and second grooves of the one of the sheaves for generating friction forces with said sheaves which dissipates the energy of the swaying forces on the lifting beam.

4,953,722

CRANE AND LIFT ENHANCING BEAM ATTACHMENT WITH MOVEABLE COUNTERWEIGHT

Thomas K. Becker, Manitowoc; Terry S. Casavant, Two Rivers; P. Ralph Helm, Manitowoc; Terry L. Petzold, Kiel; Michael J. Wanek, Two Rivers, and Art G Zuehlke, Manitowoc, all of Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Nov. 9, 1988, Ser. No. 269,222
Int. Cl.[5] B66C *23/76*
U.S. Cl. 212—156 **37 Claims**

1. An attachment for increasing the lifting capacity of a crane where the crane includes

a counterweight,

a mobile lower works,

an upper works mounted on the lower works and including a rear portion adapted to support the counterweight,

a pivotally mounted boom having a top,

an upwardly projecting mast having a top,

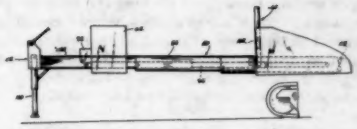
means for lifting a load from the top of the boom,

rigging means interconnecting the top of the boom and the top of the mast, and

means interconnecting the top of the mast and the rear portion of the upper works for opposing a load lifted from the top of the boom;

said attachment comprising:

a counterweight support beam including a plurality of connected segments movable relative to each other, a fore end



adapted to be connected to the crane upper works, and an aft end rearward from the rear portion of the upper works, said beam being extendable by moving said connected segments relative to each other between a first position wherein said aft end is spaced from said rear portion of said crane upper works, and a second position wherein said aft end is spaced further from said rear portion of said crane upper works,

a counterweight carrier adapted to carry the counterweight when the counterweight is supported on said support beam for movement along the length thereof and over one or more of the connections between said segments, and

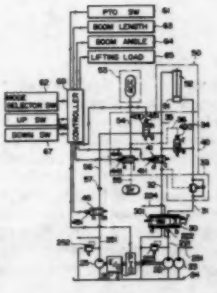
means for selectively moving said counterweight fore and aft along said beam.

4,953,723

APPARATUS FOR SUPPRESSING QUAKY MOVEMENTS OF MOBILE CRANES

Yoshimi Saotome, Takasago; Kiyotsuna Kuchiki, and Tsuyoshi Katada, both of Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 9, 1989, Ser. No. 391,048
Claims priority, application Japan, Apr. 21, 1989, 1-103250
Int. Cl.[5] B66C *13/12, 23/56*
U.S. Cl. 212—159 **6 Claims**



1. An apparatus for suppressing quaky movements of a mobile type crane, comprising:

a vehicle body supported on driven wheels;

a boom including a hydraulic cylinder and pivotally sup-

ported on said vehicle body via said hydraulic cylinder for pivoting movements about a horizontal shaft;

main hydraulic pumps connected through a transmission mechanism to an engine mounted on said vehicle body and switchable between on- and off-positions;

a direction control valve for respectively selectively supplying and draining the discharge oil pressures of said main pumps to and from a first load-holding main oil chamber and an opposing second oil chamber of said hydraulic cylinder;

a counter-balancing valve provided at a position fluidically between said hydraulic cylinder and said direction control valve;

an accumulator provided at a position fluidically between said hydraulic cylinder and said counter-balancing valve for suppressing quaky movements of said vehicle body;

travel and work mode switching means comprising a plurality of change-over valves;

a mode selector means for switching the mode of operation between a vehicle travel mode wherein a closed circuit is formed through said first and second oil chambers and said accumulator, and a working mode wherein the closed circuit is opened for supplying and draining oil pressure separately to and from said first and second oil chambers; and

a controller having means for permitting said mode selector means to switch to said travel mode position only when said main pumps are in an off state.

4,953,724

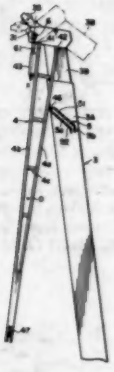
JIB STRETCHING AND FOLDING DEVICE

Yukio Koizumi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 29, 1989, Ser. No. 373,027

Int. Cl.[5] B66C 23/42

U.S. Cl. 212—188 **21 Claims**



1. In a crane including a telescopic boom having a forward end portion provided with a pair of jib mounting shafts laterally projecting from opposite side surfaces of said forward end portion, and a strut type jib having a base end portion provided with a pair of jib feet adapted to be detachably connected with said jib mounting shafts, wherein said jib may be folded along a vertical side surface of said boom in a jib folded condition where said jib feet are disposed in vertical alignment, while said jib may be stretched in a stretching operation from said forward end portion of said boom with said jib feet connected to said jib mounting shafts, a jib stretching and folding device comprising:

a connecting member comprising means for being detachably connected to a one of said jib mounting shafts to which a lower one of said jib feet arranged at a lower position in the jib folded condition is to be connected in the stretching operation, independently of said lower one of said jib feet and in such a manner as to be rotatable about said one jib mounting shaft, and

a supporting shaft mounted to a lower member of said jib at the base end portion of said jib in such a manner as to extend below said lower member when in the jib folded condition, wherein said connecting member is supported on said supporting shaft and wherein said connecting member is rotatable about said jib, whereby said jib can rotate on said one of said jib mounting shafts such that said lower one of said jib feet can pivot around said one of said jib mounting shafts.

4,953,725

CHILDREN'S DRINKING VESSEL

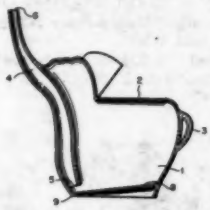
Elena M. D. M. D. Gil Buj, 105 Carretera General, Hermigua, Gomera, Tenerife, Spain

Filed May 10, 1989, Ser. No. 349,828

Claims priority, application Spain, May 10, 1988, 8801480

Int. Cl.[5] A47G 19/22

U.S. Cl. 215—1 A **3 Claims**



1. A drinking vessel for containing a supply of liquid comprising an internal pipe integrally formed along the internal wall of the vessel and having a bottom opening adjacent to the bottom of the vessel and having a top opening protruding above the entrance opening of the vessel, said pipe defining a straw to allow the contents of the vessel to be drained out,

said vessel having a slanting surface formed on the bottom of the vessel, said slanting surface sloping downwardly toward the bottom opening of said pipe, and said slanting surface forming the entire bottom surface of said vessel.

4,953,726

ELECTRIC VEHICLE COUPLING BETWEEN TWO RAIL VEHICLES

Dominique Loutan, Geneva, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Apr. 27, 1989, Ser. No. 343,599

Claims priority, application Switzerland, Apr. 28, 1988, 1586/88

Int. Cl.[5] B61G 5/06

U.S. Cl. 213—1.3 **7 Claims**

1. An electrical vehicle coupling between two rail vehicles, comprising:

an electrical contact bush for each of said vehicles, each of said contact bushes being movable between an advanced position where said contact bushes are mutually coupled and provide electrical connection between said two rail vehicles and a retracted position where said contact bushes are mutually uncoupled;

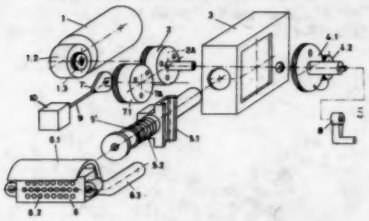
drive means for moving each of said bushes between said advanced position and said retracted position, each of said drive means including:

an eccentric element mounted to a rotatable disk wheel at a position eccentric to the axis of rotation of said disk wheel;

means for rotating said disk wheel in one direction;

a slide rail associated with a respective said bush, wherein

said eccentric element moves in a slide of said slide rail, whereby said bush moves from said retracted position to said advanced position and back to said retracted position for each revolution of said disk wheel;



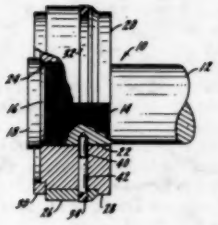
thrust pins on which said bushes are respectively mounted, said slide rails being respectively slidably mounted to said thrust pins for movement in the direction of the axis of said thrust pins, wherein each said slide extends perpendicular to a respective one of said thrust pins.

4,953,727

PISTON AND SHAFT ASSEMBLY OF RAILROAD END-OF-CAR CUSHIONING DEVICES AND METHOD OF REPAIRING SAME

Howard E. Tonn, Lombard; Robert Davidson, Vernon Hills; David B. Shultz, Villa Park, and Keith R. Miller, Schiller Park, all of Ill., assignors to Co-Ordinated Railway Services, Inc,, Broadview, Ill.

Filed Jul. 3, 1989, Ser. No. 374,954
Int. Cl.[5] B61G *9/12*
U.S. Cl. 213—8 **7 Claims**



1. A piston and shaft assembly for an end-of-car cushioning device, comprising:

a shaft having a threaded portion formed on the shaft surface and a radially-extending hole formed in the shaft in the area of the threaded portion;

a piston having an axial bore through its center with threads formed on the surface of the axial bore, said bore's threads being adapted to mate with the threads of the shaft such that the mating threads provide a positive abutment to axial movement of the piston along the shaft, the piston further including a radial hole aligned with the hole of the shaft;

a pin disposed in the aligned radial holes of the piston and shaft and extending across the interface thereof to provide positive abutment to rotational movement of the piston on the shaft, the pin having a diameter less than that of the radial hole of the piston so as to provide clearance between the pin and the piston; and

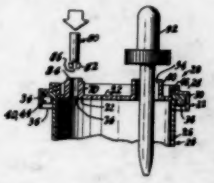
retainer means for holding the pin in the radial hole.

4,953,728

TAMPER PROOF BOTTLE

John R. Meek, P.O. Box 622, R.R. 1, Crawfordsville, Ind. 47933

Filed Dec. 5, 1988, Ser. No. 279,862
Int. Cl.[5] B65D *41/00, 39/00*
U.S. Cl. 215—250 **25 Claims**



1. A tamper-proof bottle having a cylindrical wall means providing an outlet, and a cap means also having a cylindrical wall means and a disc means extending to the cylindrical wall means of the cap means,

there being two or more abutment body means sets respectively having abutment body means respectively carried on portions of the bottle's wall means and the cap means,

the engagement of the bottle's wall means and the disc means of the cap means providing a closing of the bottle outlet and also an axial limiting abutment condition which limits how far the bottle and cap means may be moved axially into overlapping relationship,

the improvement for such a bottle and cap means comprising the provision of abutment walls on both the abutment body means of the bottle's wall means and of the cap means, said abutment walls being operatively oppositely facing circumferentially when the cap means is operatively affixed to the bottle as herein set forth for closing the bottle outlet,

one of the said abutment body means of the bottle and cap means having a resiliently flexible extension portion which is unconnected to the respective bottle or cap means except through the respective abutment body means by which the extension portion is carried, and is sufficiently flexible as to be forceable past the other abutment body means as the bottle and cap means are relatively rotated while the bottle and the cap means are then in said axial limiting abutment condition,

the location of the abutment body means of the bottle and cap means being such that without such flexibility the extension portion would be blocked by the other abutment body means so that the extension portion could not pass, during a rotation of the bottle and cap means in a first direction, the said other abutment body means sufficiently circumferentially as to let the abutment walls pass circumferentially relative to one another,

the flexibility of the extension portion being such as to permit the extension portion to move relatively axially to let the abutment walls pass circumferentially relative to one another, when the bottle and cap means are relatively rotated in that first direction;

and the resilience of the extension portion being such that after passing one another circumferentially by their relative axial movement, during relative rotation movement of the bottle and cap means in that first direction, the extension portion will move in the opposite relative axial direction to cause the two abutment walls to then be operatively oppositely facing circumferentially as aforesaid, thus blocking the bottle and cap means from being relatively rotated in the opposite direction, thus operatively locking the bottle and cap means together with the disc means of the cap means sealing the bottle's outlet.

4,953,729

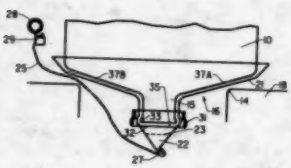
SANITATION SHIELD FOR WATER COOLER BOTTLE

George Kloosterhouse, P.O. Box 650, Malabar, Fla. 32950

Continuation-in-part of Ser. No. 319,482, Apr. 12, 1989, abandoned. This application Sep. 27, 1989, Ser. No. 413,123

Int. Cl.[5] B65B *3/04*

U.S. Cl. 215—255 11 Claims



1. For use with a water bottle which, when installed in a water cooler, is placed in an inverted position over an opening in the water cooler tank, a device for effectively shielding the water cooler tank from contaminant material that may be present on the outside of the water bottle comprising:

a shroud of non porous material sized to extend over the mouth, neck and shoulder region of said water bottle, so that, when said bottle is supported over said opening in the water cooler tank, said shroud extends beyond the edge of said opening, said shroud having a removable region for placement over the mouth of the bottle;

a retainer cap having an opening through which the removable region of said shroud extends, said retainer cap cooperating with the mouth of said bottle, so that said shroud is retained thereby and extends over the shoulder region of said bottle; and

means, attached to the removable region of said shroud, for removing the removable region of said shroud, thereby allowing the contents of said bottle to pass through the mouth of the bottle and into the water cooler tank.

5. A method of effectively shielding a water cooler tank from contaminant material that may be present on the outside of a water bottle which, when installed in a water cooler, is placed in an inverted position over an opening in the water cooler tank, comprising the steps of:

(a) providing a shroud of non porous material having a removable region for placement over the mouth of the bottle and a pull cord attached to said removable region of said shroud;

(b) placing said shroud over the mouth, neck and shoulder region of said water bottle, so that said removable region is located over the mouth of said bottle;

(c) securing said shroud to the mouth of said bottle by attaching a retainer cap, having an opening through which the removable region of said shroud extends, to the mouth of said bottle, whereby said shroud is retained thereby and extends over the shoulder region of said bottle;

(d) inverting said bottle, to the mouth of which said shroud has been secured by means of said retainer cap, and placing the inverted bottle upon said water cooler tank so that the neck of the bottle extends into the opening of the water cooler tank; and

(e) pulling said pull cord, thereby removing the removable region of said shroud, and allowing the contents of said bottle to pass through the mouth of the bottle and into the water cooler tank.

4,953,730

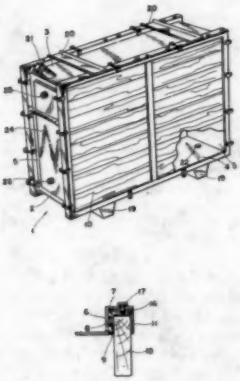
VAT

Martlyn L. Prime, Morphett Vale; Peter F. Warren; Geoffrey D. Johnston, both of McLaren Vale, and John C. Babidge, McLaren Vale, all of Australia, assignors to Stakvat Pty. Ltd., Adelaide, Australia

Filed Oct. 18, 1988, Ser. No. 259,325

Int. Cl.[5] B65D *88/10*

U.S. Cl. 217—4 20 Claims



1. A vat for the storage of liquids such as wine, said vat comprising:

an annular metal frame, each side of said metal frame having a peripheral side flange;

side walls of wooden staves closing said sides of said annular frame;

means on each of said sides closed by said wooden staves clamping said wooden staves to its respective side flange of said annular metal frame;

said wooden staves of each said side wall being supported in an angular frame, said clamping means clamping each said angular frame to its respective side flange;

said staves of each said side being arranged in parallel abutting relationship to each other;

means for applying pressure to said staves in a direction to maintain said adjacent abutting edges in sealing relationship, said pressure applying means comprising a pressure plate extending along the free edge of the stave closest to a side of said angular frame; and

pressure adjusting screws bearing against said pressure plate.

20. A vat for the storage of liquids such as wine, said vat comprising:

an annular metal frame, each said having a peripheral flange, side walls of wooden staves closing said sides of said annular frame;

an angular frame supporting said wooden staves of each side wall in parallel abutting relation to each other, clamping means clamping each angular frame to the respective side flange of the annular frame;

a pressure plate extending along a free edge of the stave closest to the angular frame; and

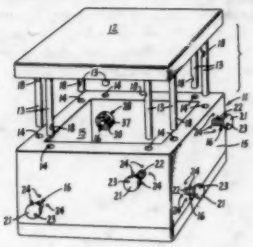
pressure adjusting screws bearing against said pressure plate to maintain the adjacent abutting edges of the staves in sealing relationship.

4,953,731

KEYLESS LOCKING APPARATUS FOR SELECTIVELY SECURING A LID TO A BOX

Michael R. Thornton, and Allison A. Thornton, both of 1495 Oak Ter., St. Joseph, Mich. 49085

Filed May 19, 1989, Ser. No. 354,291
Int. Cl.[5] B65D *43/00*
U.S. Cl. 217—56 **13 Claims**



1. A keyless locking apparatus for selectively securing a lid to a box, comprising

a box,

a lid for said box,

a post projecting from said lid,

said box being formed with a first bore in one of its walls configured to receive said post when said lid is closed,

an elongated locking member engagable with said post,

said box being formed with a second bore through said wall in perpendicularly partially intersecting relation to said first bore,

said locking member being mounted in said second bore for both axial and rotational adjustment relative to said first bore,

said post being formed with a notch registrable with said locking member when said lid is positioned to close said box,

said locking member being formed with a notch registrable with said post to permit withdrawal of said post from said first named bore when said locking member is in a predetermined rotational and axial position, whereby said post is prevented by said locking member from being withdrawn from said first bore when said notch in said locking member is not in said predetermined rotational and axial position with said post,

and settable means for effecting desired rotational and axial positioning of said locking member.

4,953,732

WASTE MATERIAL COLLECTING BIN

David C. Cocks, London, England, assignor to The Wellcome Foundation Limited, London, England

Continuation of Ser. No. 296,242, Jan. 12, 1989, abandoned. This application Mar. 8, 1990, Ser. No. 492,349
Claims priority, application United Kingdom, Jan. 13, 1988, 8800660
Int. Cl.[5] B65D *90/00*
U.S. Cl. 220—502 **8 Claims**

1. A waste material collecting bin, comprising:

a storage container;

an inlet to said storage container;

a reservoir of a fluent material-treating substance;

fluent addition means for adding said fluent substance from said reservoir to waste material added to said container; and

an arcuate support means provided in said inlet for temporarily supporting waste material while it is contacted by said fluent substance from said reservoir, said fluent addition means being disposed above said arcuate support means such that said fluent substance is added to the waste

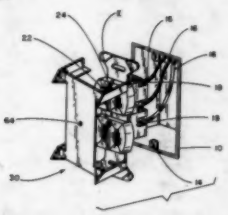
material temporarily supported on said arcuate support means from above.

4,953,733

ELECTRICAL OUTLET BOX MARKING DEVICE

Gaetano R. Loscuito, 7100 W. Stamford Dr., Bridgeview, Ill. 60455

Filed Nov. 28, 1989, Ser. No. 441,986
Int. Cl.[5] B25H *7/04*
U.S. Cl. 220—3.4 **1 Claim**



1. A marking device for defining the exact location of an electrical outlet box in a wall panel consisting of:

an I-shaped monolithic plate element having a rectangular central body portion having a front surface and a rear surface, side edges and a fastener-receiving hole defined centrally therein, a top portion and a bottom portion, said top portion having a top end edge, and said bottom portion having a bottom end edge, said top and bottom portions extending transversely of said central body portion side edges and extending beyond said side edges and forming ears on the four corners of said rectangular central body portion, each of said ears including a top edge and a bottom edge, with said top edges being collinear with said top end edge and said bottom end edge associated therewith;

each ear having an anchoring element located adjacent to said rear surface of said central body portion and a marking element adjacent to said central body portion front surface,

each of said anchoring elements being L-shaped and each including a first leg that extends parallel to the central body portion side edges and is located to be coplanar with one ear end edge, and a second leg that is located to be coplanar with an ear bottom edge and to be essentialy perpendicular to said first leg, said anchoring elements being essentially half the length of said central body portion as measured between the bottom end edges E of the ears;

each of said marking elements being arrow-head shaped and including a first leg that is positioned to be coplanar with said anchoring element first leg and a second leg that is

positioned to be coplanar with said anchoring element second leg, said marking element legs each being triangular in shape and including a base attached to an associated ear and a point-forming apex spaced from the ear with a hypotenuse connecting said base and said apex, said marking element legs being perpendicularly arranged to define a biplanar point.

4,953,734

CABIN-LIKE COVER ESPECIALLY FOR COVERING A MACHINE

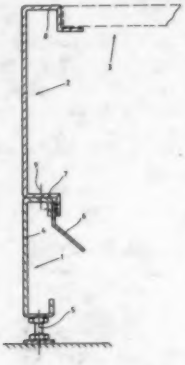
Albert Stohr, Am Wiegenberg 8, 8015 Markt Schwaben, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 317,944

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 8803330[U]

Int. Cl.[5] E04B *1/08;* E04H *1/00*

U.S. Cl. 220—4.02 **11 Claims**



1. A cabin-like cover, especially for covering a machine, including a base frame (1) and wall elements (2) mounted on said base frame in a modular system, characterized by the following features:

(a) said wall elements characterized by having been formed of sheet material and shaped by bending, each of said wall elements including an L-shaped lower portion (7) for mounting on said base frame (1) of the cabin-like cover, said L-shaped lower portion comprising a first portion for positioning atop said base frame and a second portion depending from said first portion for engaging a side portion of said base frame;

(b) said wall elements including at their side edges vertical bends (*2a, 2'a*) juxtaposed vertical bends of the adjacent wall elements; and

(c) adjacent wall elements being connected to one another by fastener means securing said vertical bends to one another.

4,953,735

CONTAINER MOVABLE FROM FLAT TO CHANNEL-SHAPED CONFIGURATION

Cosmo N. Tisbo, Barrington, and Robert J. Mack, Hoffman Estates, both of Ill., assignors to Custom Plastics, Inc., Elk Grove, Ill.

Continuation-in-part of Ser. No. 156,720, Feb. 17, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 380,763

Int. Cl.[5] B65D *5/26, 6/18;* B32B *7/06;* H02G *3/04*

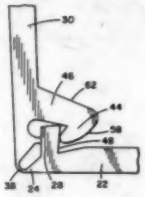
U.S. Cl. 220—6 **21 Claims**

1. An elongate container of one-piece resilient thermoplastic construction, said container comprising:

a first wall having first and second lateral edges with a first latching component positioned adjacent the first lateral edge;

a second wall having first and second lateral edges with a second latching component for interlocking with said first latching component and positioned adjacent the last-mentioned second lateral edge to fasten said walls together in a predetermined relative orientation; and

a hinge joining the first lateral edge of said first wall and the second lateral edge of said second wall, said hinge comprising a web of material having a thickness less than the thickness of said walls, said walls being relatively movable about said hinge between an as-formed position in which said first and second latching components are spaced, and a use position in which said first and second walls extend



relative to each other at a predetermined angle and said first and second latching components are in locking engagement, said container having a generally uniform cross section throughout its length so that it can be formed by extrusion,

one of said first and second latching components comprising a catch having an engagement surface extending upwardly from its respective wall.

the other of said first and second latching components comprising hook means including a support extending upwardly from its respective wall and having an undersurface extending in the direction of said catch, said undersurface adapted to engage said engagement surface and maintain said first and second walls in said use position.

4,953,736

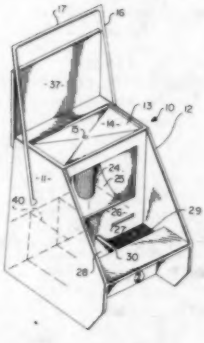
PAINT SPLATTER BOX

Frank Magnotto, 5203 Kipling St., Springfield, Va. 22151

Filed Jan. 8, 1990, Ser. No. 462,025

Int. Cl.[5] B65D *85/00*

U.S. Cl. 220—20 **7 Claims**



1. A multi compartmented splatter box comprising a box, said box being defined by side walls, a roof, a bottom and a back wall which slopes downwardly, the roof has a depression

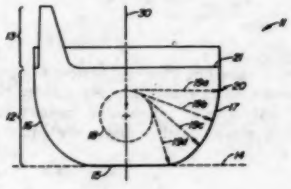
terminating at its lowest point in an opening therethrough, the sloping wall has a vertical upstanding rounded means extending from the sloping wall upwardly to the roof, at least two wells capable of containing a liquid disposed in front of the sloping wall, the box is open from the one side facing the sloping wall whereby a brush may be dipped selectively into the wells when containing a liquid and the brush may be then struck against the upstanding rounded means to thereby knock off unwanted liquid.

4,953,737

SELF-RIGHTING VESSEL

Kenneth A. Meyers, Reedsburg, Wis., assignor to Gerber Products Company, Fremont, Mich.

Filed Jan. 28, 1987, Ser. No. 3,460
Int. Cl.[5] A47G *19/22*
U.S. Cl. 250—70 **13 Claims**



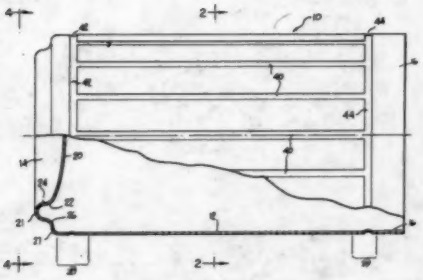
1. A self-righting vessel comprising a planar base and sides each of whose vertical cross section is an involute defined by a circle inside said vessel.

4,953,738

ONE PIECE CAN BODY WITH DOMED BOTTOM

James S. Stirbis, 5451 S. Federal Clr., Apt. D-106, Littleton, Colo. 80123

Filed Feb. 19, 1988, Ser. No. 157,804
Int. Cl.[5] B65D *8/12, 6/38*
U.S. Cl. 220—606 **36 Claims**



1. A drawn and ironed one-piece metallic aluminum can body member for beverages such as beer and soft drinks comprising:

a cylindrical relatively thin side wall portion;

a rigid dome-shape bottom wall portion;

an open end rim portion; and

stiffening means in said side wall portion for resisting deformation of said side wall portion by internal pressure, said stiffening means comprising:

a pair of axially spaced radially inwardly extending concave annular groove-rib portions of curved cross-sectional shape in said side wall portion, one of said concave annular groove-rib portions being located axially adjacent said rim portion and another one of said concave annular groove-rib portions being located axially adjacent said bottom wall portion; and

a plurality of circumferentially spaced parallel radially inwardly extending concave axial groove-rib portions in said side wall portion of curved cross-sectional shape and extending axially between said pair of concave annular groove-rib portions; said dome-shape bottom wall portion comprising:

a radially innermost concave dome-shape central portion;

a convex axially outwardly extending lowermost annular support rib portion connected to said dome-shape central portion; and

a radially outermost inclined connecting wall portion extending between said side wall portion and said lowermost annular support rib portion;

a plurality of circumferentially spaced radially inwardly extending convex groove-rib portions in said concave dome-shape central portion and extending radially inwardly from said lowermost annular support rib portion; and

a plurality of circumferentially spaced radially and axially extending concave groove-rib portions in said radially outermost inclined connecting wall portion and extending between said lowermost annular support rib portion and said side wall portion.

3. A one-piece drawn and ironed aluminum can body member for beverages such as beer and soft drinks and made from one piece of drawn and ironed aluminum sheet material and comprising:

a cylindrical relatively thin side wall portion with a central longitudinal axis;

an open end rim portion;

an annular bottom wall portion having an annular concave dome-shape central portion extending radially outwardly from said central longitudinal axis and terminating in an annular peripheral portion, a convex axially outwardly extending lowermost annular support rib portion connected to said annular peripheral portion of said dome-shape central portion, and a radially outermost annular inclined connecting wall portion extending between said side wall portion and said lowermost annular support rib portion;

a plurality of circumferentially spaced radially inwardly extending convex groove-rib portions formed in said concave dome-shape central portion and extending radially inwardly from said lowermost annular support rib portion toward said central longitudinal axis for strengthening and stiffening of said concave dome-shape central portion against deflection by internal pressure forces, each of said radial groove-rib portions having a radially innermost end portion which terminates in radially outwardly spaced relationship to said central longitudinal axis to provide an unribbed smooth surface centermost section of said concave dome-shaped central portion; and

an annular convex groove-rib portion formed in said concave dome-shape central portion and being radially inwardly spaced from said lowermost annular support rib portion and intersecting a mid-portion of each of said radially inwardly extending convex groove-rib portions for further strengthening and stiffening of said concave dome-shape central portion.

28. A one-piece metallic can body member comprising:

a cylindrical relatively thin side wall portion;

an open end rim portion;

a dome-shape bottom wall portion having a concave dome-shape central portion, a convex axially outwardly extending lowermost annular support rib portion connected to said dome-shape central portion, and a radially outermost inclined connecting wall portion extending between said side wall portion and said lowermost annular support rib portion;

a plurality of circumferentially spaced radially inwardly extending convex groove-rib portions in said concave

dome-shape central portion and extending radially inwardly from said lowermost annular support rib portion;

an annular convex groove-rib portion located in said concave dome-shape central portion and intersecting said radially inwardly extending convex groove-rib portions; and

a plurality of circumferentially spaced radially and axially extending concave groove-rib portions in said radially outermost inclined connecting wall portion and extending between said lowermost annular support rib portion and said side wall portion for strengthening and stiffening said inclined connecting wall portion.

4,953,739

CONTAINER OF SOLID COMPOSITION FOR USE AS A HOT-MELT

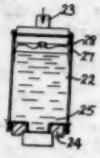
Christian Wooge, Bad Homburg, and Joachim Speisebecher, Oberursel, both of Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Jun. 19, 1989, Ser. No. 368,447

Claims priority, application United Kingdom, Aug. 12, 1988, 8819233

Int. Cl.[5] B65D *25/10*

U.S. Cl. 220—93 **5 Claims**



1. A moisture-proof container of solid, moisture-curable composition comprising a reusable tubular body portion open at one end, a closure member provided with an outlet removably secured to said open end to close said tubular body portion, a slideable piston-head confining the composition in the body portion between the piston-head and the closure member, said piston-head having a rim projecting towards the closure member and in sliding, sealing engagement with the inner walls of said tubular body portion a bag of heat-resistant resilient foil open at one end and secured around said open end by said closure member, said bag being unattached to said tubular body portion, and solid, moisture-curable composition contained within the receptacle defined by said bag and said closure member.

4,953,740

WASTEBASKET HAVING LID HINGE AND ACTUATING MECHANISM PROTECTOR

Walter Koda, Newtown, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,018

Int. Cl.[5] B65D *43/00*

U.S. Cl. 220—263 **12 Claims**

1. A wastebasket, which comprises:

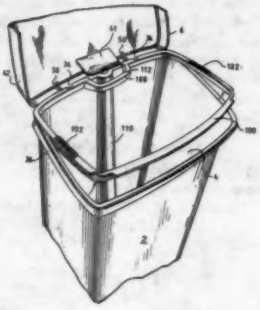
a container having a top rim defining a top opening formed therein;

a lid pivotally mounted on the container and adapted to pivot about a pivot axis to cover and uncover the top opening; said lid including a top surface and a bottom surface;

means for pivotally mounting the lid to the container;

means for maintaining said lid in an open and substantially upright position with respect to said container;

means for actuating pivotal movement of the lid with respect to the container between positions covering and uncovering the top opening, the lid movement actuating means including a generally horizontal operating lever mounted on the container at the lower portion thereof, and link means operatively interconnecting the operating lever and said lid; and



a projection extending from said bottom surface of said lid, said projection extending at least partially over said top rim of said container and said link means when said lid is in said open substantially upright position.

4,953,741

MEDICAL FAIL SAFE RELEASIBLE LOCKS AND/OR SEALS FOR CAPPED DISPOSABLE CENTRIFUGE CONTAINERS, CRYOGENIC VIALS AND THE LIKE

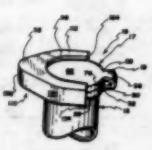
Paul M. Jessop, and David H. Jeffs, both of Salt Lake City, Utah, assignors to Multi-Technology Inc., Midvale, Utah

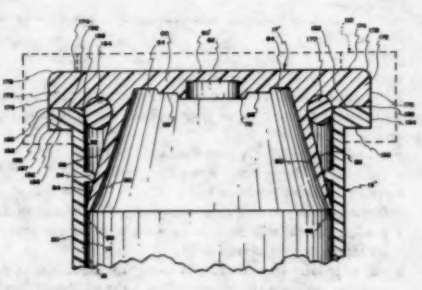
Continuation of Ser. No. 265,178, Oct. 31, 1988, Pat. No. 4,874,102, which is a continuation-in-part of Ser. No. 191,518, May 9, 1988, Pat. No. 4,830,209. This application Jul. 24, 1989, Ser. No. 385,349

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[5] B65D *45/00*

U.S. Cl. 220—273 **9 Claims**





1. In combination:

a container for receiving a biological sample to be processed

by centrifuging, boiling, freezing and the like during laboratory testing and during shipping;

the container comprising a cylindrical wall closed at one end and open at the other end defining a hollow interior;

a compression fit threadless lid releasibly closable in respect to the container comprising a resilient male portion which projects through the open end into and forcibly engages the hollow interior of the container, when the lid is closed, and a flange portion superimposed, when the lid is closed, across the end of the container which is open when the lid is not closed;

seal means separate from the lid, the seal means compressively engaging the cylindrical wall at the container opening and the male portion of the lid.

4,953,742

PLASTIC SEALING COVER

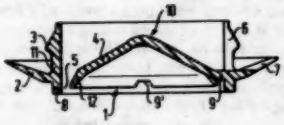
Willibald Kraus, Grünstadt, Fed. Rep. of Germany, assignor to TRW United Carr GmbH & Co. KG, Enkenbach-Alsenborn, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 318,151

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807174

Int. Cl.[5] B65D *39/00*

U.S. Cl. 220—367 **11 Claims**



1. A sealing cover formed of plastic for closing an opening in a support panel and having a circumferential elastic sealing lip for pressing against one side of the support panel with a holding stay (3) lying opposite the sealing lip (2) for pressing against the other side of the support panel and an arched sealing zone forming the central portion of the cover, the improvement wherein a circumferential wall (11) connects the sealing lip (2) with the holding stay 3, and wherein between the arched sealing zone (10) and the wall (11) there is provided at least one opening (5) and the sealing zone (10) is arched in a direction from the sealing lip toward the holding stay (3).

4,953,743

SPLASH PROOF RAISED VENT LID

Robert C. Dart, Okemos, Mich., and John R. Darras, Leola, Pa., assignors to Dart Container Corporation, Mason, Mich.

Filed Jun. 19, 1989, Ser. No. 367,602

Int. Cl.[5] B65D *51/16*

U.S. Cl. 220—369 **4 Claims**

1. A splash proof lid for use on a drinking cup comprising:

a lid having a central horizontal cover portion, said lid adapted to matingly engage the upper peripheral edge of a drinking cup so as to selectively maintain said lid in a covering relationship on said cup;

vent means provided in said cover portion, said vent means comprising a circular, horizontal top portion with a vent opening therethrough;

a first wall depending downwardly from the perimeter of said top portion, said first wall having a terminal end below the surface of said cover portion;

a second wall merged with the terminal end of said first wall, said second wall extending upwardly in an outwardly spaced apart relationship to said first wall so as to merge with the said horizontal cover portion;

a plurality of spaced apart radially extending ribs connecting said first wall and said second wall, said ribs cooperating with said first wall and said second wall to define downwardly depending arcuate wave dampening baffle means which encircle said vent means below said cover surface in close proximity thereto so as to minimize splashing of the cup contents below said lid so as to prevent accidental spillage through said vent means.

4,953,744

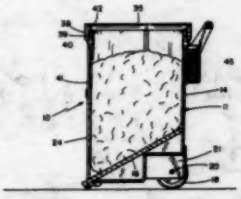
MOBILE REFUSE CONTAINER

Kunio Koyama, 22798 W. Lochnora, Hawthorn Woods, Ill. 60047

Filed Apr. 7, 1989, Ser. No. 334,475

Int. Cl.[5] B65D *25/16, 83/00*

U.S. Cl. 220—404 **10 Claims**



1. A mobile refuse container, comprising: a container having an open top forming a loading opening for refuse and flexible plastic bags, said container having an open side forming a discharge opening for the flexible plastic bag when full, said open side having sufficient height to discharge a full plastic bag, releasable means on the container for selectively holding the bag in the container near its top in an open condition, and means for automatically ejecting the bag from the container when the releasable means is activated, said means for automatically ejecting the bag from the container including a steeply inclined ramp in the bottom of the container on which the bag rests, said ramp having an uninterrupted upper surface constructed to support the flexible plastic bag.

5. A mobile refuse container, comprising: a container having an open top forming a loading opening for refuse and flexible plastic bags, said container having an open side forming a discharge opening for the flexible plastic bag when full, releasable means on the container for selectively holding the bag in the container, means for automatically ejecting the bag from the container when the releasable means is activated, and including a pair of wheels mounted on the lower end of the container.

7. A mobile refuse container, comprising: a container having an open top forming a loading opening for refuse and flexible plastic bags, said container having an open side forming a discharge opening for the flexible plastic bag when full, releasable means on the container for selectively holding the bag in the container, means for automatically ejecting the bag from the container when the releasable means is activated, and including a bag supply container on one side of the container.

10. A mobile refuse container, comprising: a container having a bottom and at least one side wall with an upper opening forming a loading opening for bags and refuse, a side opening

on the container forming a discharge opening, a selectively opening member over the side opening to prevent discharge of the bag, a ramp in the bottom of the container upon which the bag rests, said ramp having a sufficient inclination so that when the opening member is opened, the bag will discharge automatically from the container, the ramp being angled approximately 40 degrees to a horizontal plane, the pivotal member is a door, a pair of wheels mounted on the lower end of the container, a handle on the container to assist in transporting the container, and a bag supply container on one side of the container.

4,953,745

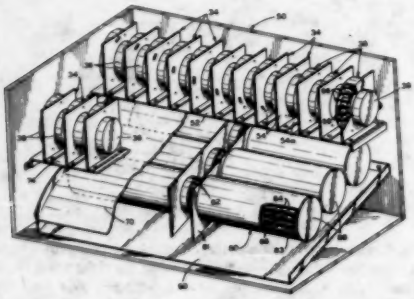
MEDICATION DISPENSING APPARATUS

James R. Rowlett, Jr., 8102 E. Jefferson St., Detroit, Mich. 48214, assignor to James R. Rowlett, Jr., Royal Oak, Mich.

Continuation of Ser. No. 533,234, Sep. 19, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 828,559

Int. Cl.[5] B65D *83/04*

U.S. Cl. 221—5 **14 Claims**



1. An apparatus for dispensing a selected one of a plurality of drugs to a selected one of plurality of patents comprising:

a plurality of individual dispensing mechanisms, each of said dispensing mechanisms adapted to store a plurality of selected drug units and responsive to a selected one of a plurality of drug dispense signals for dispensing one of the selected drug units;

means for generating an input authorization signal representing an operator;

means for generating a selected one of a plurality of patient identification signals representing a selected patient for which a drug is to be selected;

means for generating a selected one of a plurality of drug select signals representing the drug to be dispensed;

control means responsive to the input authorization signal, the patient identification signal, and the drug select signal for generating a drug dispense signal corresponding to the selected drug to cause said dispensing mechanism to dispense the selected drug;

said control means including means responsive to said drug dispense signal for recording the dispensing transaction including the operator, the patient, and the dispensed drug;

said control means being operable to supply any of said plurality of drug units for any of said plurality of patients upon receiving the required input authorization, patient identification, and drug select signals.

4,953,746

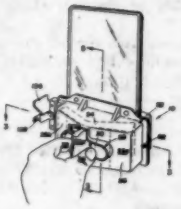
ONE-AT-A-TIME COUPON DISPENSER

Michael Andriash, P.O. Box 3881 Main Post Office, Vancouver, B.C., Canada V6B 3Z3

Continuation-in-part of Ser. No. 23,405, Mar. 9, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,479

Int. Cl.[5] B65H *1/02, 1/12*

U.S. Cl. 221—35 **7 Claims**



1. A sheet dispenser for dispensing sheets, comprising:

(a) a pair of separable hollow enclosures each having a front wall and an opening therein with a height dimension equal to the height dimension of said sheets and a width dimension sufficient to permit a user to insert at least one finger into said opening and fold a portion of a front sheet outwardly of a stack of sheets through said opening, each of said front walls having front wall portions inclined from the opening rearwardly towards the ends, forming planar or slightly concave surfaces, each of said enclosures for holding a stack of individual sheets and each having means for resiliently urging an associated stack of sheets against a corresponding one of said front walls; and

(b) means for mounting a sidewall of said enclosures to a shelf edge such that said enclosures extend outwardly of such shelf edge with front walls thereof substantially perpendicular to said shelf edge.

4,953,747

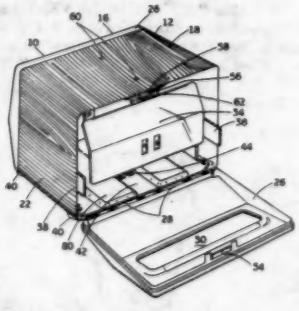
TABLE MODEL NAPKIN DISPENSER

Gregory J. Wenkman, 6690 Shamrock Glen Cir., Middleton, Wis. 53562, and Ferdinand F. Salzmann, 605 Ray St., Prairie du Sac, Wis. 53578

Filed Apr. 7, 1988, Ser. No. 178,575

Int. Cl.[5] A65D *83/00*

U.S. Cl. 221—45 **3 Claims**



1. A dispenser for folded sheets of flexible material comprising:

(a) a cabinet having a front end, a back end, a top, a bottom, and two sides, the bottom of the cabinet having two centrally located slots;

(b) a door forming at least one of the two ends, the door

having an access window for extraction of folded sheets of flexible material and means for opening the door;

(c) means for pushing the folded sheets of flexible material against the door; and

(d) a clip for securing and detaching the cabinet to and from a horizontal surface, the clip comprising:

(i) a flat plate with a first side and a second side that is independent of the cabinet;

(ii) two vertical barbs that extend vertically from the first side of the flat plate and that engage with the slots in the bottom of the cabinet, the flat plate being disengaged from the cabinet upon pinching of the barbs together; and

(iii) means for affixing the second side of the flat plate to the desired surface.

4,953,748

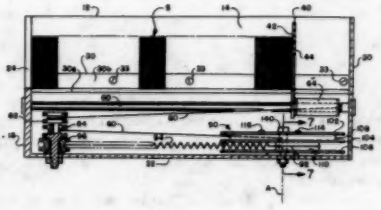
FORCE MODIFYING DEVICE

Norman R. Wheelock, Mentor, Ohio, assignor to Diebold, Incorporated, North Canton, Ohio

Continuation of Ser. No. 236,066, Aug. 23, 1988, abandoned. This application Feb. 14, 1990, Ser. No. 480,370

Int. Cl.[5] B65H *1/12*

U.S. Cl. 221—59 **4 Claims**



1. An elongated, generally rectangular currency canister for moving a stack of sheet currency toward a dispensing position at one end thereof where individual sheets are dispensed, said canister having a first lengthwise compartment for holding said stack of currency, a second lengthwise compartment, and a device for biasing said stack in the direction of said dispensing position, said biasing means comprising:

plate means disposed within said first and second compartments movable along a predetermined plate path between a first position remote from said dispensing opening and a second position adjacent said dispensing opening for pushing said stack in said first compartment toward said dispensing position,

plate cable means having a first end and second end, said first end being connected to said plate means in said second compartment,

a tension spring disposed in said second compartment having a stationary end fixed relative to said dispensing position and a free end movable along a predetermined spring path within said second compartment between a first position wherein said spring is extended a predetermined distance and a second contracted position, said spring defining a tension force having a predetermined value when in said first position which diminishes as said spring retracts along said spring path toward said second position,

spring cable means having a first and a second end, said first end being connected to said free end of said tension spring, and

a force modifying member disposed in said second compartment for transmitting said tension force in said spring to said plate means to move said plate means along said plate path, said modifying member being rotatable through at least 270 degrees about an axis fixed relative to said dispensing opening from a first rotation position corresponding to said first spring position and second rotation position corresponding to said second spring position and having first and second outwardly facing noncircular arcuate surfaces to receive said tension spring cable means and said plate cable means respectively, said first arcuate surface being generally helical in shape and spiraling outwardly, said second ends of said cable means being attached to said modifying member wherein said spring cable means is disposed on said first surface when said spring is in said first position, said tension force biasing said modifying member to rotate in a predetermined direction wherein said plate cable means is wound onto said second arcuate surface and said spring cable means is unwound from said first arcuate surface and said rotation of said member producing a resultant force on said plate means via said plate cable means to force said plate means toward said dispensing position, said first and second surfaces being dimensioned to vary the respective distances between said spring cable means and said plate cable means and said axis as said modifying member rotates, the ratio of the distance between said spring cable and said axis relative to the distance between said plate cable and said axis continually increasing as said modifying member rotates from said first position to said second position.

4,953,749

CHIP SEPARATION AND ALIGNMENT APPARATUS

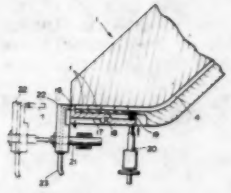
Shigeru Kubota, Tokyo; Shoji Kanou, Yokohama, and Masahiro Kubo, Sagamihara, all of Japan, assignors to Nitto Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 54,497, May 27, 1987, Pat. No. 4,801,044. This application Dec. 5, 1988, Ser. No. 280,222

Claims priority, application Japan, May 27, 1986, 61-121799; Nov. 17, 1986, 61-273682; Mar. 12, 1987, 62-057649

Int. Cl.[5] B23Q *7/12*; B65H *9/06*

U.S. Cl. 221—168 **5 Claims**



1. A chip separation and alignment apparatus comprising:

(a) a chip separation and alignment section;

(b) said chip separation and alignment section comprising a chip cassette formed into a flat rectangular box-like shape;

(c) said chip cassette being formed therein with:

(i) a chip storage chamber;

(ii) a chip alignment hole provided with an upper end opening through which said chip alignment hole is communicated with a lower portion of said chip storage chamber and a lower end opening; and

(iii) at least one air ejection port arranged near said upper end opening to intermittently eject air therethrough; and

(c) a chip separation section arranged at said lower end opening of said chip alignment hole to separate chips one by one and successively supply said separated chips to a subsequent step,

(d) wherein said chip separation section includes:

(i) a see-saw rod formed at a distal end thereof with a shutter for operating said lower end opening of said chip alignment hole and pivotally mounted below said lower end opening and

(ii) a chip suction head arranged in front of said lower end

opening so as to be reciprocated by a predetermined distance.

4,953,750

DISPENSING METHOD FOR A VARIABLE VOLUME DISPOSABLE CARBONATED BEVERAGE CONTAINER

Frank W. Abernathy, 1518 River Bend Rd., Columbus, Ohio 43223

Filed Apr. 3, 1989, Ser. No. 332,581
Int. Cl.[5] B65D *23/02, 25/16;* B67D *5/00*
U.S. Cl. 222—1 1 Claim

1. A method for retaining carbonation in carbonated beverages which comprises:

supplying an inner collapsible bag liner filled with a liquid carbonated beverage and having a mouth attached to a nozzle and which filled liner is placed within a container having an opening wherein said nozzle retains said liner mouth at said container opening;

dispensing said carbonated beverage from said liner; and

after said dispensing, tying off said liner at the liquid/air interface so as to prevent loss of carbonation from said carbonated beverage in said liner.

4,953,751

OVERFLOW PREVENTION FOR SOFT DRINK DISPENSERS

Joseph W. Shannon, Kent, Ohio, assignor to ABC/Sebrn Tech-Corp., Akron, Ohio

Filed Mar. 30, 1989, Ser. No. 330,767
Int. Cl.[5] B67D *5/30*
U.S. Cl. 222—14 12 Claims

10. A system for dispensing a drink into a container, comprising:

a dispensing head receiving a first conduit defining a first flow path for a first fluid, and a second conduit defining a second flow path for a second fluid;

valve means interposed within said first and second conduits for enabling and inhibiting respective flows of said first and second fluids from said first and second conduits; and

sensing means interposed within said first and second flow paths for sensing completion of an electrical connection between said first and second flow paths.

4,953,752

CONCRETE AND MORTAR DISTRIBUTION PROCESS AND APPARATUS

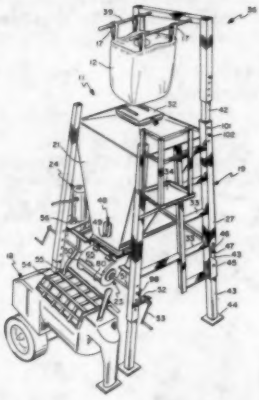
Robert C. Tousignant; James W. Tousignant, and Richard L. Tousignant, all of St. Paul, Minn., assignors to E-Con-Mega Mix, St. Paul, Minn.

Filed Dec. 16, 1988, Ser. No. 285,126
Int. Cl.[5] G01F *11/24*
U.S. Cl. 222—23 24 Claims

1. A hopper apparatus for dispensing premixed and predetermined quantities of granulated materials comprising:

a. a body structure having a side wall structure, a bottom portion, and a top portion having an inlet port, said side wall structure having at least a portion with a sloped configuration of a predetermined angle;

b. a discharge chute structure mounted at the bottom portion of said body structure in a predetermined position, said chute structure having metering means mounted therein and being constructed and arranged to provide a predetermined output of granulated material and being operable at the exterior of said body structure, said metering means further being a rotatable vane structure having a rotating shaft and a plurality of vane members, said chute and



rotatable vane structure being mounted to said body structure bottom whereby two adjacent vane members are exposed between generally the one and three o'clock position; and

c. Adjustable leg structures having means to adjust the height of said apparatus so as to vertically position said discharge chute structure.

4,953,753

FLUID DISPENSING APPARATUS WITH PRESTRESSED BLADDER

Norman Gortz, Newport Beach, Calif., assignor to The Norman Company, Newport Beach, Calif.

Filed Jun. 10, 1988, Ser. No. 205,158
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—105 18 Claims

1. A fluid dispenser comprising

a container body;

a resilient bladder of generally tubular shape having an open end; and

an internal prestressing mandrel comprising a first end, a second end, at least three fins joined at a common longitudinal edge to form a plurality of passages therealong, and a flange on the first end connectable to a valve means, said resilient bladder being stretched around the mandrel and sealed around the first end and the second end of the

mandrel, the resilient bladder being subjected to both radial and axial stresses,

wherein the valve means comprises a ferrule having a gasket surface on one side thereof; a spring; a cup member positioned within the first end of the mandrel, the cup member having a shoulder therein and biased by the spring against the gasket surface to form a seal against the gasket surface; and a hollow stem inserted through the ferrule and the gasket surface and into the cup member contacting the shoulder therein, the gasket surface sealing against an outer surface of the hollow stem, the cup member being movable away from the gasket surface by depression of the hollow stem forming a communication channel from the passages, past the gasket surface into the cup member, and into the hollow stem,

wherein the ferrule secures the valve means to the flange.

4,953,754

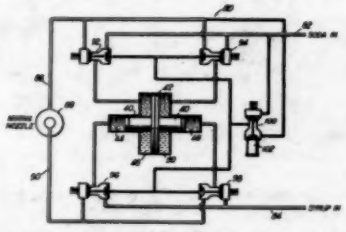
BEVERAGE DISPENSER SYSTEM USING VOLUMETRIC RATIO CONTROL DEVICE

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 888,546, Jul. 18, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 265,203

Int. Cl.[5] B67D 5/56

U.S. Cl. 222—129.2 **3 Claims**



1. A dispensing valve for a beverage dispenser comprising:

(a) a body including a water passageway therethrough and a separate concentrate passageway therethrough;

(b) valve means for controlling the flow through said passageways;

(c) a nozzle for mixing together water and concentrate and for dispensing said mixture therefrom;

(d) a double acting volumetric ratio control device in said dispensing valve for controlling the ratio of water to concentrate in the beverage dispensed from said dispensing valve, said device including a reciprocatable piston in a cylinder defining two water chambers and two concentrate chambers, said water passageway being in fluid communication with each water chamber and said concentrate passageway being in fluid communication with each concentrate chamber;

(e) said valve means including a single solenoid, a pilot valve using water as the pilot fluid, and four 3-way poppet valves, two in each of said water and concentrate passageways between the ratio control device and said nozz[1]e, said solenoid being connected to said pilot valve, and said pilot valve operating said 3-way valves, each one of said four 3-way poppet valves being connected in said passageways to control the flow to and from a respective one of said four chambers; and

(f) means for energizing said solenoid once for every cycle of operation of said device.

4,953,755

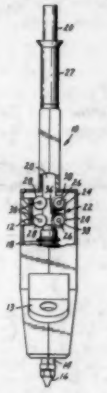
AUTOMATED THERMOPLASTIC DISPENSING DEVICE

Richard L. Dennison, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 3, 1988, Ser. No. 252,688

Int. Cl.[5] B67D 5/62

U.S. Cl. 222—146.5 **1 Claim**



1. A device for dispensing molten thermoplastic material comprising:

a frame;

a barrel member mounted on said frame and having an internal melting chamber communicating with an outlet opening through a nozzle;

a sleeve having one end secured at said barrel member and a through opening communicating with the end of said melting chamber opposite said outlet-opening, said sleeve being adapted to receive a rod of solid thermoplastic material with one end portion of the rod in the melting chamber and the rod projecting through said sleeve along a predetermined path;

means for heating said barrel member to melt the end portion of the rod therein;

driving means adapted to be switched between a deactivated state and different forward activated states for driving said rod of solid thermoplastic material into said melting chamber at different predetermined rates to expel molten thermoplastic material through said nozzle at different predetermined rates, said driving means comprising at least one drive roller having an axis and a periphery adapted for engagement with said rod of solid thermoplastic material, means for rotatably mounting said drive roller on said frame adjacent the end of said sleeve opposite said chamber with said axis transverse of said path and said periphery positioned to afford driving engagement with a said rod of solid thermoplastic material projecting though said sleeve along said path, a reversible direct current motor having a rotor, drive means for coupling said rotor to said drive roller, and motor control means for deactivating said motor and for operating said motor to rotate said rotor shaft in a forward rotational direction at different predetermined rates of speed so that said motor rotates said drive roller in a direction to move said rod of solid thermoplastic material into said melting chamber at different predetermined rates to expel molten thermoplastic material through said nozzle at different predetermined rates; and

suck back means operable upon switching of said drive means from any one of said forward activated states to said deactivated state adapted for moving said rod of solid thermoplastic material a single predetermined distance out

of said melting chamber to cause molten thermoplastic material in said nozzle to flow toward said melting chamber and restrict movement of that molten thermoplastic material out of the nozzle, said suck back means comprising means in said motor control means sequentially operated upon deactivation of said motor for shorting electro motive forces in said motor to ground, and for applying a predetermined amount of power to said motor to rotate said rotor in said motor in a reverse rotational direction through a predetermined angle.

4,953,756

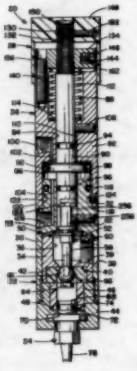
MODULAR DISPENSING SYSTEM

John P. Breault, New Britain, and Ewald F. Dickau, Glastonbury, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 176,877, Apr. 4, 1988, Pat. No. 4,930,669, which is a continuation-in-part of Ser. No. 57,614, Jan. 3, 1987, abandoned. This application Sep. 26, 1989, Ser. No. 412,770

Int. Cl.[5] F16D *1/00*; B05C *11/00*

U.S. Cl. 222—309 **18 Claims**



1. A modular system for dispensing precise quantities of fluid product comprising:

a self-contained dispensing unit including dispensing means for dispensing the fluid product when in an open configuration and for stopping or prohibiting dispensing when in a closed configuration, said dispensing means including (i) a housing defining a reservoir for containing the fluid product under pressure, (ii) an inlet for introducing said fluid product to said reservoir under pressure, (iii) a valve means for controlling the dispensing of the fluid product from said reservoir, (iv) an end member and (v) sealing means intermediate said fluid product and an actuator means for sealingly isolating said actuator means from said fluid product;

a self-contained actuator unit including (i) a cylindrical body having a cavity at one end and (ii) actuating means for effecting said valve means between the open and closed configurations; and

two sets of mutually engageable locking means on said dispensing unit and on said actuator unit for releasably fixedly attaching said dispensing unit to said actuator unit, said first set of mutually engageable locking means comprising a male T-connector on said valve means and a similarly formed female receptive slot on said actuating means such tat when the end member of said dispensing unit is inserted into the cavity of said actuator unit the male T-connector, when aligned with the female slot, is received by the slot and the actuator unit is rotated 90° relative to the dispenser unit, withdrawal of the male T-connector from the female slot is thereby prevented and the valve means and actuating means are locked together and operate in a unitary manner; and said second set of mutually engageable locking means comprises an annular groove formed in said end member and one or more set-screws threadingly engaged through the cylindrical body of the actuator unit into the cavity such that when the end member is inserted into the cavity, said set-screws engage the annular grove;

said modular system characterized by the ability to readily connect and disconnect said dispensing unit from said actuator unit without loss of fluid product.

4,953,757

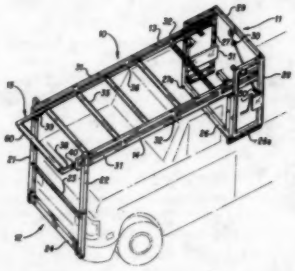
FRONT RACK FOR A TRUCK

James R. Stevens, and Jodi Stevens, both of 515 Douglas St., Tillamook, Oreg. 97141

Filed Jun. 14, 1989, Ser. No. 365,703

Int. Cl.[5] B60R *9/00*; B60P *3/10*

U.S. Cl. 224—310 **7 Claims**



1. A front loading truck rack comprising:

a bed frame assembly mounted immediately behind the cab of a truck;

a vertical bumper post assembly mounted to the bumper in front of said truck;

a horizontal frame assembly horizontally disposed between said bed frame assembly and said bumper assembly and attached thereto, said horizontal frame assembly mounted over the truck cab;

ramp means pivotably mounted to said horizontal frame assembly in front of said truck cab, said ramp means being lowerable so that a load can be disposed on top of the ramp means and lifted up easily and without great difficulty;

said bed frame, bumper post, horizontal frame and ramp assemblies are formed from hollow tubing;

said bed frame comprises two parallel rectangular bed side frames and one rectangular bed front frame connecting said two side frames;

said bumper post assembly comprises two parallel vertical posts, a lower post cross member disposed and attached between the bottom of said posts, and a middle post cross member disposed and attached between the middle of said posts to prevent said ramp means from resting on the hood of a vehicle;

said horizontal frame assembly comprises two parallel elongated side frame members, each elongated side frame member attached to one of said vertical posts and one of said bed side frames;

said ramp means comprising two parallel ramp side members, and ramp cross members disposed between said ramp side members, said ramp side members are disposed between and pivotably mounted at a pivot point to an adjacent horizontal side frame member;

threaded shafts mounted inside said bumper posts;

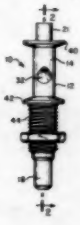
threaded nuts mounted around said threaded shafts;
longitudinal slots on said bumper posts;
lever means affixed to said threaded nuts and extending through said bumper post slots, said ramp means resting atop said lever means, said lever for lifting up or lowering said ramp means;
gearing mounted on a lower end of said bumper post shaft;
threaded shafts mounted inside said middle post cross member, said middle post cross member shafts having gearing at one end intermeshing with said gearing on said bumper post shafts, said middle post cross member shafts having gearing at an opposite end;
drive gear mounted in the center of said middle post cross member and intermeshing with said gearing on said opposite ends of said middle post cross member shafts, such that when said drive gear is rotated said middle post cross member shafts and said bumper post shafts rotate raising or lowering said nut and therefore raising or lowering said ramp means.

4,953,758

VALVE CONSTRUCTION

Vincent Passalacqua, Yonkers, N.Y., assignor to Mark-O Industries, Mount Vernon, N.Y.

Filed Oct. 24, 1988, Ser. No. 245,025
Int. Cl.[5] B65D *88/54*
U.S. Cl. 222—341 **14 Claims**



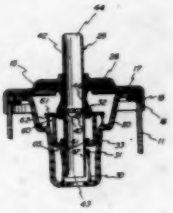
1. A valve for pumping fluid from a container comprising:
a valve body;
a valve chamber having a wall, said chamber being in said valve body;
a first end of said body having an entrance passage therethrough communicating with said chamber to provide a passage for the flow of fluid from a container to said valve chamber;
a plunger;
a piston within said chamber, connected to said plunger and movable therein in response to depression of said plunger;
a seat in said chamber;
flexible sealing means adjacent to said piston and movable therewith, said sealing means including a resilient washer and a rigid washer in axial abutment, said rigid washer being between said resilient washer and said entrance passage, said resilient washer having a diameter slightly larger than the diameter of said valve chamber, said rigid washer having a diameter slightly less than the diameter of said valve chamber;
biasing means in said body of biasing said seal against said seat;
a spout;
an exit passage extending between said spout and said chamber and sealed by said seal when said seal is in the seated position;
and a normally closed check valve between said chamber and said entrance passage;
depression of said plunger causes said resilient washer to flex sufficiently to permit passage of fluid between said seat and said chamber wall to said exit passage, and return of said plunger creates a decreased pressure in said valve chamber to permit fluid to flow through said entrance passage and open said check valve to refill said chamber, said resilient washer wiping the valve chamber wall when said piston returns.

4,953,759

METERING VALVE FOR DISPENSING AEROSOLS

William J. Schmidt, Xenia, Ohio, assignor to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Apr. 14, 1989, Ser. No. 338,800
Int. Cl.[5] B05B *1/00*
U.S. Cl. 222—402.2 **6 Claims**



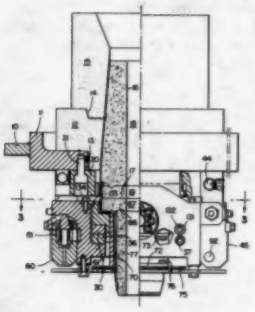
1. A metering valve assembly for dispensing measured quantities of an aerosol from a pressurized container, comprising:
(a) an annular member forming a cap for sealed attachment to a pressurized container,
(b) a main housing attached to said cap and adapted to depend therefrom in said container with the interior thereof open to said container,
(c) a tubular valve member supported in said cap and housing for lengthwise movement between charging and dispensing positions,
(d) said valve member having an internal wall separating the interior thereof into an inlet chamber and a discharge chamber within the inner and outer ends of said valve member,
(e) said discharge chamber having a supply port in the side thereof adjacent said wall and a dispensing outlet spaced lengthwise of said valve member from said supply port and open to the atmosphere,
(f) said inlet chamber having an outlet port adjacent said wall and an inlet port spaced from said outlet port lengthwise of said valve member and open to the interior of said container,
(g) diaphragm means within said housing including a partition wall of resilient material surrounding said valve member and of normally larger inner periphery than the outer periphery of said valve member to define therewith an annular metering chamber,
(h) inner and outer annular seal means forming the opposite inner and outer ends of said metering chamber and having slidable sealing engagement with said valve member, and
(i) said supply and outlet ports being located in predetermined spaced relation on said valve member such that when said valve member is in said charging position, said supply port will be sealed from said metering chamber and said outlet port will be open to said metering chamber for flow of the contents of said container into said metering chamber, and when said valve member is in said dispensing position, said outlet port will be sealed from said metering chamber and said supply port will be open to said metering chamber,
(j) whereby upon movement of said valve member from said charging position to said dispensing position, the pressure within said container will collapse said diaphragm wall and thereby force the contents of said metering chamber through said supply port to said dispensing outlet.

4,953,760

SLIDE-GATE POURING APPLIANCE FOR LADLES AND SIMILAR DEVICES

Salvatore Foglio, Taranto, Italy, assignor to Nuova Sanac S.p.A. and ILVA S.p.A., both of Genoa, Italy

Filed Jun. 9, 1989, Ser. No. 363,857
Int. Cl.[5] B22D *41/40*
U.S. Cl. 222—600 15 Claims



1. Slide-gate pouring device comprising:

a first metal frame, solid with the bottom of a ladle, and supporting a first fixed holed refractory plate,

a second removable metal frame, hanging with a clearance from said first metal frame and supporting a pair of fixed guides on which, through complementary guides there runs

a third sliding metal frame supporting a second holed refractory plate, between a first working position in which the hole in the first fixed refractory plate is aligned with the hole in the second holed refractory plate, and a second working position in which the holes in said first fixed and said second refractory plates are out of axis and do not interfere with each other, in which said slide-gate pouring appliance has tightening means capable of pressing said second holed and said first fixed hole refractory plates against one another and maintaining contact between them, on each side of said second removable metal frame a container for springs is jointed to a lower end of a pair of link rods, upper ends of which are jointed to said first metal frame, and in which said springs apply a prod against an outer flange on said second removable metal frame and in which the axis of action of the springs is outside a straight line joining centres of pins articulating said link rods.

4,953,761

STOPPER ROD SPATIAL CONTROL MECHANISM

Oleg Fishman, Maple Glen, Pa.; Satyen N. Prabhu, Maple Shade; John P. Burk, Mt. Holly, both of N.J., and Emad Tabatabaei, Bensalem, Pa., assignors to Inductotherm Corp., Rancocas, N.J.

Filed Sep. 27, 1988, Ser. No. 249,806
Int. Cl.[5] B22D *37/00*
U.S. Cl. 222—602 15 Claims

1. A stopper rod spatial control mechanism for use with a bottom discharge holding reservoir for molten metal having a nozzle, comprising

a base;

an outer tube having a longitudinal axis perpendicular to said base, said outer tube being swingably mounted about an axis parallel to and spaced away from said longitudinal axis;

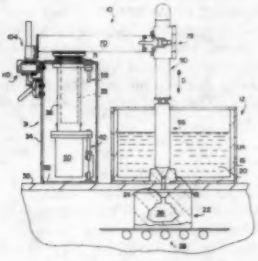
an inner tube telescopically mounted within said outer tube, and being reciprocally movable along said longitudinal axis and being rotatable about said longitudinal axis,

a servomotor fixedly mounted at a lower end of said outer tube;

a ball screw connected to said servomotor;

a ball nut affixed to said inner tube and cooperating with said ball screw;

a boom having a first end and a second end, being affixed to said inner tube adjacent said first end and being rotatable with said inner tube about said longitudinal axis;



a stopper rod depending from said second end of said boom; and

means operatively associated with said boom for braking said boom;

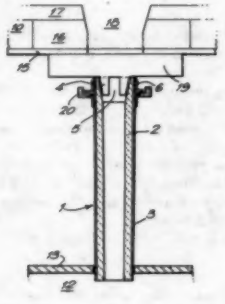
whereby said stopper rod is aligned with the nozzle by the combined movements of rotating said inner tube about said longitudinal axis and swinging said outer tube about said axis parallel to said longitudinal axis, then fixing said alignment via said braking mechanism, and thereafter reciprocally moving said stopper rod above the nozzle by actuation of said servomotor.

4,953,762

POURING TUBES

Jean P. Villani, Charleville-Mezieres, France, assignor to Foseco International Limited, Birmingham, England

Filed Sep. 26, 1988, Ser. No. 248,987
Claims priority, application United Kingdom, Sep. 24, 1987, 8722442
Int. Cl.[5] B22D *41/54*
U.S. Cl. 222—606 8 Claims



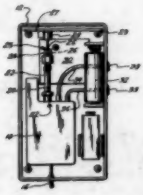
1. A pouring tube for use in casting molten metal consisting of an inner tube of refractory heat insulating material, said inner tube having an exterior peripheral surface; and an outer layer of fibrous mat intimately laminated to said inner tube only over substantially all of said exterior peripheral surface thereof.

4,953,763

ANIMAL SCENT DISPENSING APPARATUS

Chandler T. Kierum, 124 Jeansonne St., Pineville, La. 71360, and Leonard J. Dupree, 2007 Dixie St., Alexandria, La. 71309

Filed Nov. 4, 1988, Ser. No. 267,537
Int. Cl.[5] G04C *5/08*
U.S. Cl. 222—644 8 Claims



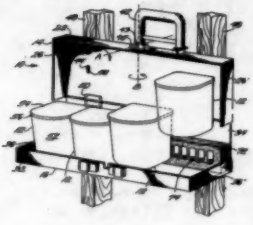
1. An animal scent dispensing apparatus comprising:
(a) a housing that can be supported in an elevated position above the ground;
(b) animal lure dispensing reservoir means contained by the housing for containing a liquid animal scent to be dispensed from the reservoir in small amounts at intervals and over several days;
(c) outlet means for releasing a small volume of fluid scent from the reservoir at pre-selected time intervals as determined by a timer within said housing, each in a drip-like fashion so that the dispensed fluid scent will ball to the ground;
(d) valved air line means communicating with the reservoir means, for maintaining a vacuum on the reservoir means when not dispensing fluid therefrom;
(e) timed valving means within the housing responsive to said timer and operable between open and closed flow positions for venting the reservoir means at the valved air line means to thereby valve flow from the reservoir means via the outlet means; and
(f) power supply means within the housing for powering the timed valving means.

4,953,764

CONTAINER SYSTEM FOR MANAGING NAILS, SCREWS AND THE LIKE

Kovacs, Mark S., 117 Brookpine Dr., Apartment 2107, Columbia, S.C. 29210

Filed Sep. 5, 1989, Ser. No. 402,908
Int. Cl.[5] A45C *15/00;* A45F *5/02;* B25H *3/02;* A47F *5/08*
U.S. Cl. 224—151 14 Claims



1. A system for use with small objects, such as nails, screws and the like, comprising:
a plurality of containers dimensioned for holding a multiplicity of said small objects; and
a means for storing said plurality of containers,
said containers each having
a container body with a curved interior and a rim, and
a lid removably attachable to said container body, said container body and said lid removable from said storing means,
said storing means having
a lower portion dimensioned for said plurality of containers,
an upper portion opposing said lower portion, said lower portion hingedly attached thereto about a first axis on one side of said storing means to said upper portion, and
means for latching an opposing side of said storing means, said upper portion latched to said lower portion, said latching means having a carrying handle pivotally attached to said storage means, said carrying handle pivoting about a second axis from a latching position to an unlatching position and further pivoting about a third axis perpendicular to said first axis from said unlatching position to a noninterfering position with respect to said storing means.

4,953,765

HORSE GROOMING ORGANIZER

Vicki A. Little, P.O. Box 781, 204 Sun Season, and Barbara J. Barton, P.O. Box 782, 213 Whispering Sands, both of Santa Teresa, N. Mex. 88008, assignors to Vicki A. Little and Barbara J. Barton, a part interest to each

Filed Jan. 6, 1989, Ser. No. 294,008
Int. Cl.[5] A45F *4/00;* B65D *30/22*
U.S. Cl. 224—151 7 Claims

1. A horse grooming organizer system comprising:
a generally rectangular sheet-form body member made of flexible fabric;
a doubled over edge at a top end of said sheet-form body member and connected at its edge in firm assembly with said body member to form a transverse channel;
stiffening means comprising a rod-like pole in said channel;
eyelet support members positioned at opposite sides of said transverse channel by means of which said body member can be suspended from a support;
a folded over edge at a bottom end of said sheet-form body member and operatively connected in firm assembly with said body member to form a plurality of transversely extending rectangular channel sections;
planar rigidifying means in said channel sections;
strap means connected to opposite sides of the bottom end of said body member at the endmost of said channel sections and to lateral edges of said body member thereby to form

the channel sections into a rectangular trough-shaped shelf;

a plurality of transversely extending hook and loop fastening strips connected to said body member to form spaced apart parallel connecting means; and

a plurality of pouches and pockets forming storage members releasably secured to the connecting means, each storage member having a cooperating hook and loop fastening strip attached to a backside thereof for matching with one of said connecting means,

said pockets and pouches being variably shaped and configured to receive horse grooming components of complementary size and shape.

4,953,766

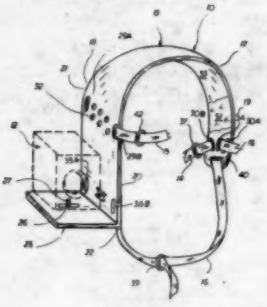
HEADGEAR CAMERA MOUNT

Thomas R. Cruickshank, 6431 Askeland Dr., Anchorage, Ak. 99507

Filed Oct. 31, 1989, Ser. No. 430,868

Int. Cl.[5] A42B *1/24*; G03B *29/00*

U.S. Cl. 224—181 **10 Claims**



1. A headgear device for mounting a camera substantially at eye level comprising:

(a) a frame having an elongated arcuate portion adapted to fit over the top of the wearer's head, a flat side panel having opposed outer and inwardly directed surfaces and upper and lower extremities, said upper extremity being emergent from said arcuate portion as a continuous integral extension thereof in a manner permitting resilient movement of said arcuate portion, and a shelf panel positioned perpendicularly and connected to said side panel and adapted to be disposed in a horizontal orientation when in use, said shelf panel having a positioning slot elongated in the direction of said side panel and a threaded bolt adapted to more within said positioning slot and secure a camera to said shelf, and strap-holding slots disposed within said side panel and arcuate portion,

(b) a first retaining strap of adjustable length adapted to lie against the wearer's forehead and engaging said strap-holding slots,

(c) a second retaining strap of adjustable length adapted to lie against the rear of the wearer's head and engaging said strap-holding slots, and

(d) a third retaining strap of adjustable length adapted to lie beneath the chin of the wearer and engaging said strap-holding slots.

4,953,767

HOLSTER MOUNTING PLATFORM

Christopher E. Bennett, P.O. Box 8226, Raleigh, N.C. 27611-8226

Filed Oct. 31, 1989, Ser. No. 430,671

Int. Cl.[5] F41C *33/02*; A45F *5/00*

U.S. Cl. 224—192 **7 Claims**

1. A handgun holster mounting platform for mounting a holster to a leg of a user, comprising:

(a) a lower mounting platform sized and adapted to receive a handgun holster thereon having a plurality of horizontal and vertical slots located therein;

(b) an upper faceplate having folded over flap at the upper portion thereof defining a loop through which a user's waist belt may be threaded;

(c) a disc means having an aperture therethrough, said loop loosely passing through said aperture;

(d) a strap means for adjustably connecting the upper faceplate to the lower platform by threading said strap through said aperture of said disc means and through not less than two horizontal slots located in said lower mounting platform;

(e) an upper mounting belt sized to fit around a leg of a user and adjustably threaded through not less than four upper vertical slots located in the lower mounting platform;

(f) a lower mounting belt sized to fit around a leg of a user and adjustably threaded through not less than two lower vertical slots located in the lower mounting platform;

(g) buckling means located at the ends of said upper mounting belt;

(h) buckling means located at the ends of said lower mounting belt; and whereby said upper and lower mounting belts cooperate with a handgun holster to secure a handgun holster to said mounting platform and to a leg of a user.

4,953,768

GOLF BAG RAIN COVER

Clarence W. Muse, 7613 Burgess St. W., Apt. D, Tacoma, Wash. 98467

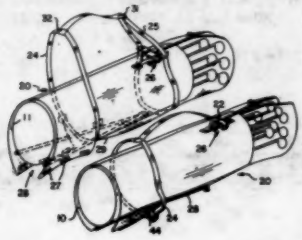
Filed Feb. 28, 1989, Ser. No. 316,812

Int. Cl.[5] A45C *11/00*

U.S. Cl. 224—205 **12 Claims**

1. A golf bag rain cover comprising: a cover member surrounding a golf bag, a connecting means to removably attach a portion of an inside of said cover member to said golf bag; and a shoulder strap attached at an upper end of said strap to said connecting means; wherein said connecting means comprises an inner webbing affixed to said inside of said cover

member, on a strapside portion of said cover member, above a midpoint of a centerline of said cover member, said inner



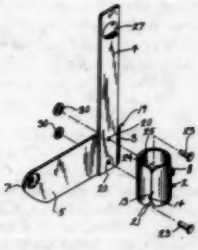
webbing terminating in two ends releasably connectable to each other.

4,953,769

BATON CLIP

Kevin L. Parsons, 16 Wagon Wheel Dr., Appleton, Wis. 54915; Gary M. Grundy, 921 E. Hamilton St., Milwaukee, Wis. 53201, and Jacqueline M. Dunstan, 604 Aspen St., South Milwaukee, Wis. 53172

Filed Mar. 31, 1989, Ser. No. 332,237
Int. Cl.[5] A45F 5/00
U.S. Cl. 224—247 4 Claims



1. In a baton clip of the type which includes a base member, a retaining band attached to the base member, the retaining band having a generally cylindrical shaped wall member when in a relaxed state, and having a longitudinal slit extending through the wall member defining two longitudinal engaging edges which form a longitudinal break in the generally cylindrical shaped wall member in the relaxed state, the retaining band being adapted for holding the baton by slidably inserting the baton therethrough, and the retaining band being deformable to allow the baton to be broken out laterally through the longitudinal break, the improvement wherein:

the longitudinal edges are formed of a hard material; and

the retaining ring has a high restorative force toward the relaxed state;

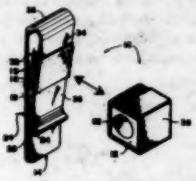
whereby when the baton is broken out through the longitudinal break, and after the baton has cleared the longitudinal edges, the retaining band sharply restores toward the relaxed state, thrusting the hard longitudinal edges together with sufficient velocity to produce a loud snapping sound.

4,953,770

POOL CUE CHALK HOLDER

Thomas Bond, Sr., 16885 McGregor Blvd., Fort Myers, Fla. 33908

Filed Jan. 24, 1989, Ser. No. 301,520
Int. Cl.[5] A45F 3/14; A63D 15/16
U.S. Cl. 224—250 7 Claims



1. A pool cue chalk holder comprising: a clip that is selectively attachable to an article of clothing, said clip including an elongate, generally flat inner member that is engagable with an inner surface of the article of clothing, an elongate outer member having a generally plate-like outer face area and being interconnected with said inner member and extendable over an outer surface of the article of clothing, and spring means for urging said inner and outer members toward each other; and

complementary first and second hook and loop fastening elements, said first element including a strip of hook and loop material that is secured to said outer face area of said outer clip member and said second fastening element surrounding and being attachable to a pool cue chalk; said second fastening element having sections engaging at least four sides of said pool cue chalk; at least a portion of each section having complementary hook and loop material attached such that a selected one of at least four sides of said chalk may be placed against said clip causing said second fastening element to engage with said first fastening element to detachably fasten said chalk to said clip.

4,953,771

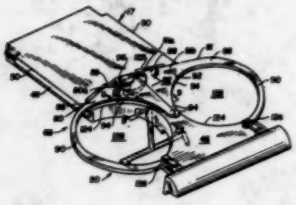
DRAWER MOUNTED CUP HOLDER

Douglas A. Fischer, Grand Rapids, and Joseph S. Meinke, Rockford, both of Mich., assignors to Lescoa, Inc., Kentwood, Mich.

Filed Feb. 28, 1989, Ser. No. 316,971
Int. Cl.[5] A47B 37/00; F16M 13/00; A47C 7/62
U.S. Cl. 224—273 12 Claims

1. A cup holder for supporting at least one beverage container in a vehicle, comprising a drawer member, fixed support means therefor, and container retaining means carried by the drawer member, the fixed support means including means for mounting the holder in a vehicle, and means supporting the drawer member on the mounting means for reciprocating movement relative to the mounting means between an operative position extending outwardly of the mounting means and a storage position extending inwardly relative to the mounting means, the container retaining means being mounted to the drawer member for pivotal movement therewith about a verti-

cal axis relative to the fixed support means and for movement relative to the drawer member between a retaining position forming therewith a container retaining configuration and a collapsed position forming with the drawer member a compact configuration occupying a space smaller than the space occupied by the container retaining configuration, the cup holder further comprising means carried by the drawer member biasing the container retaining means toward the retaining position, the fixed means including cam means engaged with the container retaining means to urge the container retaining means to the collapsed position upon movement of the drawer



member from the operative position to the storage position, the drawer member comprising a substantially flat horizontal member formed with a first curved edge portion, the container retaining means comprising a cup ring and means mounting the cup ring on the drawer member for pivotal movement relative thereto about a vertical axis between the retaining position and the collapsed position, the cup ring being formed with a second curved edge portion complementary to the first curved edge portion to define therewith a container receiving aperture when the cup ring is in the retaining position, the biasing means comprising a spring interposed between the drawer member and the cup ring.

4,953,772

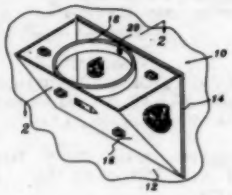
ASHTRAY REPLACEMENT DRINK HOLDER

Greg Phifer, Rte. 2, Box 816, Henry, Nebr. 69349

Filed Nov. 17, 1986, Ser. No. 930,890

Int. Cl.[5] B60R 7/00

U.S. Cl. 224—282 **1 Claim**



1. A drink holder for mounting within a conventional ashtray holding slot formed in a vehicle dash, said drink holder comprising:

a. drawer positionable within said ashtray holding slot;

b. drink holding ring securable to said drawer, said drink holding ring being rotatably mounted to said drawer; and,

c. drink bottom support means slidably attached to a bottom portion of said drawer, said drink bottom support means being positionable beneath said drink holding ring.

4,953,773

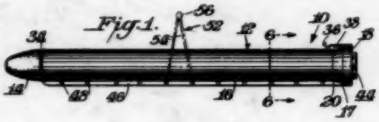
SKI CARRIER

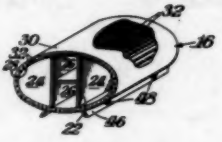
John G. Wirth, R.D. #2, Box 140 F, Landenberg, Pa. 19350

Filed Aug. 14, 1989, Ser. No. 393,225

Int. Cl.[5] B60R 9/12

U.S. Cl. 224—328 **31 Claims**





1. A ski carrier in combination with two skis, said ski carrier comprising a generally rigid tube having a front nose and a rear cap interconnected by a body portion, a divider in said body portion dividing said body portion into a plurality of individual compartments, said cap being connected to said body portion by connecting means whereby said cap is selectively movable to an open position which provides access to said compartments and to a closed position which closes said compartments, locking means for selectively maintaining said cap in said closed position, said compartments including a pair of side compartments each of which is dimensioned to snugly hold an individual ski therein with the binding of the ski spaced from the wall of said body portion, and each of said skis being in a separate one of said compartments.

4,953,774

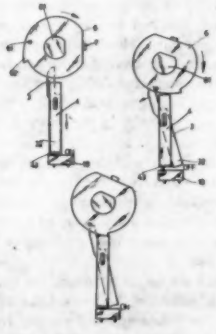
ELECTRIC STAPLING GUN WITH AUTO-RESET, ENERGY-SAVING AND SHOCK-ABSORBING FUNCTIONS

Motor Lai, Taichung-Hsien, Taiwan, assignor to Regitar Power Tools Co., Ltd., Taya Taichung Hsien, Taiwan

Filed Apr. 26, 1989, Ser. No. 344,684

Int. Cl.[5] B25C 5/15

U.S. Cl. 227—131 **1 Claim**



1. An electric stapling gun comprising:

a trigger mounted in the stapling gun:

a first link rod pivoted on an inner side of said trigger and capable of moving therewith;

a second link rod formed with an elongated slot put on to a pin on the inner side of said trigger and a projection for receiving a lower end of said first link rod so that said second link rod will move downwards when said first link rod is pressed and will return to original position by means of a spring when said trigger is released;

a cam fixedly mounted on an output shaft of a gearing and having a lobe on which there is a pin for pushing a ram, said lobe being designed such that when said cam rotates, said lobe will push said first link rod away from said micro-switch and press said second link rod to activate said micro-switch once again;

a micro-switch disposed below said first link rod so that when said trigger is pressed to move said first link rod downwards, said first link rod will turn on said micro-switch with a lower end thereof and connect a power supply to a driving motor to rotate said cam so as to urge said ram to hit a staple out of said stapling gun;

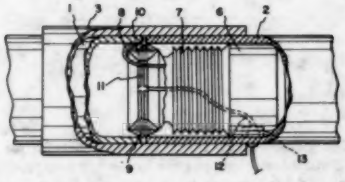
a spring with different pitches at both ends and used to push said ram to carry out stapling action; and

a metallic protective ferrule fixedly mounted in said electric stapling gun and used to receive said spring and part of said ram and having a rubber pad on an inner end thereof.

4,953,775
METHOD OF EFFECTING A SINGLE JOINT BETWEEN TWO PIPES

Goran Lande, Stockholm, Sweden, assignor to Norabel AB, Nora, Sweden

Filed Mar. 15, 1988, Ser. No. 168,156
Claims priority, application Sweden, Apr. 7, 1987, 8701441
Int. Cl.[5] B23K *20/08*
U.S. Cl. 228—107 **5 Claims**



1. A method for effecting a single joint between the ends of two pipes, comprising the steps of:

inserting into the end of one said pipe a displacement device and peripherally anchoring said displacement device to the inner surface of the pipe;

inserting into the end of said one said pipe with displacement device a single inner peripheral body including explosive charge and detonator, said inner peripheral body being located between said displacement device and the pipe end;

arranging an outer peripheral body around the outer surface of one of the pipes, leaving the pipe end exposed;

arranging said pipes such that the ends are opposite each other without axial displacement, and substantially abutting each other;

expanding the anchored displacement device in the axial direction so as to cause the inner peripheral body to move toward the pipe ends and be centered between the pipe ends, and subsequently collapsing said displacement device so that it is no longer anchored;

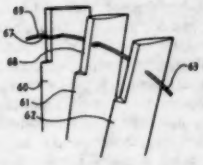
locating said outer peripheral body over the pipe ends; and

detonating the explosive so as to explosion weld the pipe ends, with the single inner peripheral body joined to the pipe ends and the outer peripheral body serving as a support.

4,953,776
TURBINE BLADE REPAIR

Michael J. Fraser, Broughton Hackett, United Kingdom, assignor to Refurbished Turbine Components Limited, Droitwich, United Kingdom

Filed Sep. 15, 1989, Ser. No. 407,637
Claims priority, application United Kingdom, Sep. 16, 1988, 8821812
Int. Cl.[5] B23K *31/00*; F01D *5/28*; B23P *15/02*
U.S. Cl. 228—119 **15 Claims**



1. A method of repairing a turbine blade of the type having a lacing wire, said method incorporating the steps of:

(a) removing any connection between the lacing wire and the turbine blade to be repaired and other blades adjacent the blade to be repaired;

(b) removing any connection interconnecting adjacent members making up the lacing wires;

(c) causing relative movement in a circumferential direction of said lacing wire members in a direction clockwise and/or anti-clockwise so that the lacing wire members are moved in a direction away from the blade to be repaired;

(d) carrying out a repair step on the blade to be repaired after said lacing wire has been removed therefrom;

(e) moving the members forming said lacing wire in opposite directions to which it had previously been moved so as to re-establish said lacing wire in its proper position;

(f) remaking any connection previously disconnected to enable said movement.

4,953,777
METHOD FOR REPAIRING BY SOLID STATE DIFFUSION METAL PARTS HAVING DAMAGED HOLES

Glenn E. Griffith; Joaquin Bustamante; Michael D. Scheel, all of San Antonio, and Herbert Koven, Southlake, all of Tex., assignors to Chromalloy Gas Turbine Corporation, Orangeburg, N.Y.

Continuation of Ser. No. 916,642, Oct. 8, 1986, abandoned. This application May 11, 1988, Ser. No. 193,213
Int. Cl.[5] B23K *31/00*
U.S. Cl. 228—119 **28 Claims**

1. A method for repairing by solid state diffusion a damaged portion of an inner surface of a pin-mounting hole of a used turbine engine metal part, wherein said hole has been stress damaged during service while mounted to another part via a pin passing through said hole, which comprises,

machining said stress damaged hole to provide a cylindrical diameter sufficient to remove the damaged portion there-

from and provide said used component with a new hole with a smooth finish,

providing a metal bushing having inner and outer diameters, said outer diameter being of size and finish relative to the machined diameter of the said hole to provide a close fit therewith,

the composition of said metal bushing being compatible with that of the metal part,

inserting said bushing into the machined hole of the metal part,

providing a cylindrical metal single piece mandrel of diameter corresponding to the inner diameter of the bushing, the diameter of said mandrel being sufficient to provide a close fit with said bushing,

inserting said single piece mandrel into the bushing to provide an assembly thereof with said metal part,

said metal single piece mandrel having a mean coefficient of thermal expansion of at least about 10% greater than that of the metal bushing for a selected solid state diffusion temperature sufficient to provide pressure to said bushing,

and then subjecting said assembly under substantially non-oxidizing conditions to solid state diffusion at an elevated solid state temperature corresponding to at least about 50% of the absolute melting point (solidus) of the metal part for a time at least sufficient to diffusion bond the bushing under pressure to said metal part by virtue of the expansion of said mandrel in said bushing at said diffusion temperature, but not exceeding that temperature and time at which substantial grain growth occurs,

cooling said assembly to ambient,

removing said mandrel,

and then machining the inner diameter of said diffusion-bonded bushing to the specified diameter of said metal part.

4,953,778

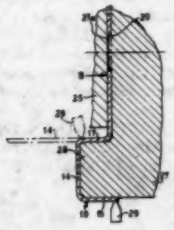
METHOD OF MAKING TORSIONAL VIBRATION DAMPER HAVING A ROLL SPUN HOUSING

Thomas J. Critton, East Amherst, N.Y.; Donald S. Johnson, Fort Erie, Canada; Walter P. Pukalo, Blasdell, N.Y., and Ralph Yorio, Easton, Pa., assignors to Vibratech, Inc., Buffalo, N.Y.

Division of Ser. No. 81,003, Aug. 3, 1987, Pat. No. 4,872,369. This application Jun. 8, 1989, Ser. No. 363,621

Int. Cl.[5] B21D *22/16*

U.S. Cl. 228—173.6 **14 Claims**



1. A method of making a viscous torsional vibration damper of the kind operating on the shear film principle and having an annular channel shaped housing providing an annular working chamber within which is mounted an annular complementary inertia mass ring and a viscous damping fluid substantially filling shear film spaces between working surfaces of the inertia ring and confronting working surfaces of the housing within said chamber, comprising:

roll spinning a metal blank into a generally channel shaped housing shell and by said roll spinning providing an axially facing base wall and annular radius corners joining said base wall to spaced generally axially extending radially inner and radially outer walls and which walls provide said housing working surfaces;

providing an integral annular hub flange extending radially inwardly from the distal edge of said radially inner wall;

providing an annular series of spaced bolt holes in said hub flange;

forming a spinning roll work hardened burnished finish on said housing working surfaces;

forming a rabbet having an axially outwardly facing shoulder seat on the distal edge of said radially outer wall and encircled by an annular lip flange of larger inside diameter than the inside diameter of said radially outer wall;

providing a circular closure of an outside diameter complementary to and closely fitting within said lip flange and seating an axial face at said outside diameter of the cover plate on said shoulder seat;

providing bolt holes in said closure and matching said bolt holes in said hub flange;

hermetically sealing the interfaces of said hub flange and said cover plate; and

hermetically sealing and radially outer edge of said cover plate within said rabbet.

4,953,779

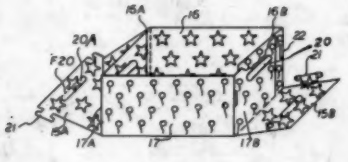
REVERSIBLE FOLDABLE CONTAINER AND CLOSURE THEREFOR

Mark S. Densen, 18 Blackburn Pl., Summit, N.J. 07901

Continuation of Ser. No. 104,354, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 888,365, Jul. 23, 1986, abandoned, which is a continuation of Ser. No. 674,691, Nov. 26, 1984, abandoned. This application Jun. 6, 1988, Ser. No. 203,068

Int. Cl.[5] B65D *5/42*

U.S. Cl. 229—23 R **2 Claims**



2. A knock-down container and cover therefor for use as a utility domestic storage box for home use comprising a first blank of foldable sheet material having a first pair of spaced apart foldlines to define opposed side and connected end panels, and a second pair of spaced apart foldlines spaced intermediate the width of said blank and extending normal to and between said first pair of spaced apart foldlines to define therebetween a bottom panel, opposed outer end panels connected to said bottom panel, said outer end panels being separated from its contiguous inner end panels whereby said side panels and inner end panels can be folded relative to said bottom panel to define a rectangular container in the erected position of said first blank, and said outer end panels being folded into overlying position relative to the contiguously folded inner end panels in the erected position of said container, means for detachably interlocking said panels in the erected position of said container, indicia means disposed on both sides of said first blank, said indicia means defining a separate and different predetermined decorative and complementary pattern on each side of said first blank which are co-extensive in area to that of said first blank, and a second blank of foldable sheet material, said second blank of sheet material having transverse foldlines to define a cover panel and connected side and end flaps adapted to be oppositely folded relative to said cover panel to form a cover for said container in the erected position of said second blank, said second blank having complementary indicia means defining a predetermined and different decorative pattern on each side of said second blank co-extensive in area to

that of said second blank, said indicia means on said first blank complementing said indicia on said second blank, each of said blanks being adapted to be reversely folded about its respective foldlines so that in their respective erected positions, said container and closure therefor can be formed with mixed and matched indicia depending upon the direction in which the respective blanks are folded in erecting said container and closure therefor.

4,953,780

POSTCARD WITH PERSONAL PHOTOGRAPH

Thomas H. Ross, 4525 E. Gainey Ranch Rd. #254g330401, Scottsdale, Ariz. 85258

Filed Sep. 5, 1989, Ser. No. 402,339

Int. Cl.[5] B42D *15/02;* **B44C** *5/02*

U.S. Cl. 229—92.8 **6 Claims**

1. A postcard comprising:

(a) a substantially rigid sheet member having a first surface, a second surface, and a plurality of edges, said first surface having a space for an address and a space for a personal message;

(b) adhesive means on said second surface of said sheet member for holding a photograph of a first predetermined size thereon;

(c) a protective sheet for covering said adhesive means, said protective sheet including

(i) a central portion overlying said adhesive means, said central portion having a plurality of sides,

(ii) a perimetric border portion surrounding said central portion and divided from said central portion by means of a weakened line, said perimetric border portion comprising a plurality of outer edges coextensive with the edges of said sheet member and parallel to the sides of said central portion, and

(iii) pull means attached to said central portion for facilitating separation of said central portion from said perimetric border portion, said pull means comprising a tab extending from a side of said central portion to an edge of said perimetric border portion,

said central portion being detachable from said perimetric border portion and releasable from said adhesive means to define a space for receiving a photograph.

4,953,781

CLOSURE FOR A CONTAINER

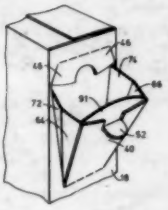
William T. Bryan, 927 Garnoa Dr., Springfield Township, Hamilton County, Ohio 45231

Filed Jul. 22, 1988, Ser. No. 222,850

Int. Cl.[5] B65D *17/28, 5/74*

U.S. Cl. 229—125.11 **20 Claims**

1. A pour spout assembly for a container having a wall which comprises a first tongue formed from the wall and hinged to the wall and a second tongue formed from the wall and hinged to the wall, the first tongue being defined by a transverse slit in said wall and downwardly extending upright slits in said wall at opposite ends of the transverse slit, the first tongue being hinged to the wall at lower ends of the upright slits, the second tongue being defined by said transverse slit and by upwardly extending slits at opposite ends of the transverse slit, the second tongue being hinged to the wall at upper ends of the upright slit of the second tongue, and a web member a central portion attached to an inner face of the first tongue, outer glue panels attached to an inner face of the container adjacent the first tongue, and accordian pleat panels connecting the central portion and the outer glue panels, free edges of the central panel of the web being hinged to the accordian pleat panels, outer edges of the accordian pleat



panels being hinged to the glue panels, the first tongue swinging between a closed position in which the first tongue is aligned with the wall and an upper portion of the central portion of the web overlaps a portion of the inward face of the second tongue and covers and closes the transverse slit and an open position in which the first tongue extends upwardly and outwardly from hinging means of the first tongue.

4,953,782

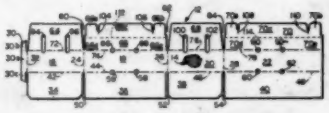
FRESH PRODUCE SHIPPING CONTAINER WITH SELF-LOCKING TOP

Carl M. Noland, Winter Haven, Fla., assignor to Nekoosa Packaging Corporation

Filed Sep. 20, 1989, Ser. No. 409,780

Int. Cl.[5] B65D *5/10*

U.S. Cl. 229—157 **37 Claims**



1. A shipping container having an interior and an exterior and being formed from a generally rectangular blank of a relatively rigid, foldable sheetlike material, said container comprising:

a tubular body portion formed from four serially connected body panels in said blank by bending along fold lines at the junctures of said body panels and by connecting the first and last of said serially connected body panels to one another, said tubular body portion including a first pair of opposed, spaced apart body panels that extend generally parallel to one another and a second pair of opposed, spaced apart body panels that extend generally parallel to one another and generally transversely of said first pair of opposed, spaced apart body panels, said tubular body portion having a first end extending transversely of said body panels and a second end spaced from said first end and extending transversely of said body panels; and

self-locking means closing one of said first end and said second end of said tubular body portion, said self-locking means comprising:

first flap means comprising a pair of flaps, one of said pair of flaps having a free edge and being foldably attached to one of said first pair of body panels at a first transverse fold line, said one of said pair of flaps further being folded at said first transverse fold line to extend transversely with respect to said one of said first pair of body panels toward the other of said first pair of body panels, the other of said pair of flaps having a free edge and being foldably at-

tached to the other of said first pair of body panels at a second transverse fold line, said other of said pair of flaps further being folded at said second transverse fold line to extend transversely with respect to said other of said first pair of body panels toward said one of said first pair of body panels, said one of said pair of flaps comprising at least one elongate slot extending transversely substantially from said first transverse fold line partly to the free edge of said one of said pair of flaps, said other of said pair of flaps comprising at least one elongate slot extending transversely substantially from said second transverse fold line partly to the free edge of said other of said pair of flaps; and

second flap means comprising at least one flap, said at least one flap having a free edge and being foldably attached to one of said second opposed pair of body panels at a third transverse fold line and being folded at said third transverse fold line to extend transversely with respect to said one of said second opposed pair of body panels toward the other of said second opposed pair of body panels, said at least one flap being cut along spaced apart, parallel cut lines extending transversely from said free edge of said at least one flap partly to said third transverse fold line to form first and second end tabs and an intermediate tab between said first and second end tabs in said free edge of said at least one flap, a first inward portion between said first end tab and said third transverse fold line and a second inward portion between said second end tab and said third transverse fold line, said first end tab being received in said at least one elongate slot in said one of said pair of flaps interiorly of said one of said pair of flaps, said second end tab being received in said at least one elongate slot in the other of said pair of flaps interiorly of said other of said pair of flaps, said intermediate tab, said first inward portion and said second inward portion being positioned exteriorly of said one of said pair of flaps and said other of said pair of flaps, said first end tab being substantially coplanar with an immediately adjacent portion of said first inward portion and being non-hingedly connected thereto.

4,953,783

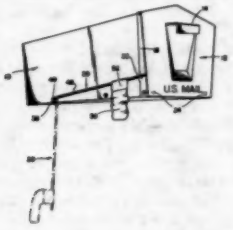
MAILBOX SIGNAL DEVICE

John D. Chambers, Rt. 2 Box 363C, Azle, Tex. 76020

Filed Dec. 20, 1988, Ser. No. 286,694

Int. Cl.[5] D65D *91/00*; A47G *29/12*

U.S. Cl. 232—35 **3 Claims**



1. An automatic signaling device for attachment to a standard rural delivery mailbox having a sidewall, said mailbox having a door at the front end, said door having a flange bent rearward a short distance over said sidewall and a bent out tab formed on said rearwardly bent flange, said door being mounted for pivotable movement about the bottom edge of said front end from open to closed positions with respect to said front end, comprising:

(a) a rod member; and

(b) fastening means connecting said rod member near the rear end of said sidewall for allowing said rod member to pivot by gravity from a position extending forwardly and upwardly adjacent said side wall to a position extending downwardly below the lower boundary of said sidewall;

(c) said rod member having a length sufficient to engage said bent out tab formed on said rearwardly bent flange at a position between said forwardly and upwardly extending position and said downwardly extending position and said rod member front end being a straight configuration;

(d) whereby when said door is closed and said rod member then moves downward from said forwardly and upwardly extending position, said straight front end of said rod member comes to rest on said bent out tab on said door flange in a substantially forwardly extending position, said rod member being released to fall into said downwardly extending position when said door is opened.

4,953,784

VENTILATOR DRIVE SYSTEM

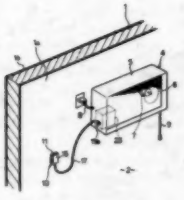
Hitoshi Yasufuku, and Toshikazu Ogata, both of Nagayo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 099919, Sep. 22, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 334,819

Claims priority, application Japan, Dec. 24, 1986, 61-313767

Int. Cl.[5] F24F *7/00*

U.S. Cl. 236—44 A **1 Claim**



1. A ventilator drive system comprising:

(a) an electric motor for driving a fan for ventilation of a room;

(b) humidity sensing means for sensing the relative humidity of indoor air, said humidity sensing means comprising a humidity sensing element formed from a material having an electrical resistance value which varies when subjected to said humidity and a base plate secured to a wall of said room with a metallic heat transferable member interposed therebetween, said humidity sensing element being disposed on said base plate so that heat is transferred from said wall to said humidity sensing element, said humidity sensing means producing a signal, the level of which corresponds to sensed relative humidity of said indoor air;

(c) reference level setting means for setting a reference level of said relative humidity of said indoor air, said reference level setting means being provided with a plurality of reference levels which are selectively set therein, one of said reference levels corresponding to a relative humidity of approximately 100%, said reference level setting means producing a reference signal, the level of which corresponds to any one of said reference levels of said relative humidity of said indoor air; and

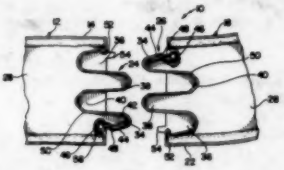
(d) control circuit means for comparing said signal produced from said humidity sensing means with said reference signal produced from said reference level setting means, thereby driving said motor when said relative humidity of said indoor air exceeds said reference level.

4,953,785

TRACK ASSEMBLY FOR TOY VEHICLE

Tadeusz Keska, Smithfield, R.I., assignor to Hasbro, Inc., Pawtucket, R.I.

Filed Aug. 29, 1988, Ser. No. 237,843
Int. Cl.[5] E01B *23/00*; A63H *19/30*
U.S. Cl. 238—10 A 11 Claims



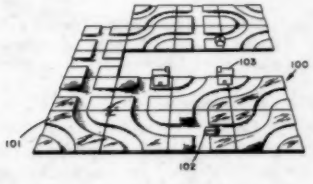
1. A track assembly for a toy vehicle comprising a first track section having a first end and a second track section having a second end, each of said track sections including at least one longitudinally extending track element for guiding said vehicle in its movement thereon, said first track section including an integrally molded fastening tongue element on he first end thereof, said second track section including means defining a receiving slot on the second end thereof, said fastening tongue element being of elongated configuration and including an elongated longitudinally extending main portion which extends outwardly terminating in an outer end and an elongated longitudinally extending resilient finger which is integrally joined to said main portion adjacent said outer end and extends inwardly along one side of said main portion, said finger being resiliently deflectable to enable said fastening tongue element to be releasably resiliently snap received in engagement in said receiving slot for releasably connecting said first and second track sections together so that they are maintained in substantially aligned end-to-end relation.

4,953,786

TOY ROADWAY TILE

Duane R. Arsenault, 860 Prospect St., Gardner, Mass. 01440, assignor to Duane R. Arsenault, Gardner and Alan J. Kirby, Tyngsboro, both of, Mass.

Continuation of Ser. No. 6,931,639, Nov. 17, 1986, abandoned. This application Dec. 30, 1988, Ser. No. 292,463
The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.
Int. Cl.[5] E01B *23/00*
U.S. Cl. 238—10 B 13 Claims



1. A two-sided reversible toy roadway tile, comprising:

(a) a first main body having a top surface, a bottom surface and at least three straight edges of equal length and contour along which the full length of each said edge the main body of a similar roadway tile abutts, wherein the interstices of said edges coincide with the vertices of an imaginary circumscribed regular polygon, wherein the center points of said edges coincide with the center points of the straight edges of said imaginary circumscribed regular polygon, wherein each of said edges is antisymmetric about said center points, and wherein said top surface forms one side of the roadway tile,

(b) a second main body having a top surface, a bottom surface and at least three straight edges of equal length, and contour along which the full length of each said edge the main body of a similar roadway tile abutts, wherein the intersections of said edges coincide with the vertices of an imaginary circumscribed regular polygon, wherein the center points of said edges coincide with the center points of the straight edges of said imaginary circumscribed, regular polygon, wherein each of said edges is antisymmetric about said center point, and wherein said top surface forms the reverse side of the roadway tile,

(c) roadways defining a pattern on said top surface of the first main body and on said surface of the second main body, and wherein the roadways of said first main body are of a different pattern than the roadways of said second main body,

(d) configurations defining land areas on said top surface of the first main body and on said top surface of the second main body, and wherein the land areas of said first main body are of a different configuration than the land areas of the second main body,

(e) a tab plate which is interspaced between the bottom surface of said first main body and the bottom surface of said second main body, and wherein each straight edge of the imaginary circumscribed regular polygon of said first main body is aligned with a congruent straight edge of the imaginary circumscribed regular polygon of said second main body to form a roadway tile, said tab plate having a projection which extends beyond each of said sets of aligned edges to provide means for engaging a similar roadway tile, and wherein said projection is inserted between a main body and corresponding tab plate of said similar roadway tile, so that, when the two roadway tiles are properly engaged, an edge of either the first main body or of the second main body of said roadway tile abutts an edge of either the first main body or of the second main body of said similar roadway tile, and whereby the pattern of roadways on said roadway tile and said similar roadway tiles are contiguous, and

(f) means for securing the bottom surface of said first main body and the bottom surface of said second main body to opposite sides of said tab plate, wherein the patterns of roadways on said joined roadway tiles may be varied by reversing the orientation of one of said sides of the roadway tile, or alternatively by changing the alignment of an edge of either said first main body or of said second main in relation to an edge of said similar roadway tile.

4,953,787

TWO PIECE RAIL FASTENING ASSEMBLIES FOR WOODEN CROSS TIES

Graham M. Fee, Geneva, Ohio, assignor to Chemetron-Railway Products, Inc., Wheeling, Ill.

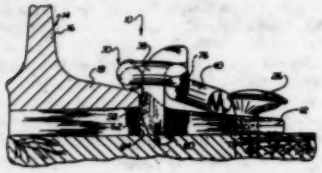
Continuation of Ser. No. 6/266,928, May 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 6/240,411, Mar. 4, 1981, abandoned, and a continuation-in-part of Ser. No. 6/228,804, Jan. 27, 1981, Pat. No. 4,442,973, and a continuation-in-part of Ser. No. 6/262,710, May 11, 1981, Pat. No. 4,625,912, said Ser. No. 6/240,411, Continuation of Ser. No. 6/930,232, said Ser. No. 6/228,804, Continuation of Ser. No. 5/933,630, said Ser. No. 4/262,710, Continuation of Ser. No. 6/57,823. This application Oct. 20, 1988, Ser. No. 260,479
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[5] E01B *09/30*
U.S. Cl. 238—349 6 Claims

1. A boltless two-piece rail fastening assembly for fastening a railway rail supported on a conventional tie plate to a wooden cross tie, comprising:

(a) an S-shaped rail clip having a singular central leg, and a rail bearing leg and a tie bearing leg spaced on opposite

sides of said central leg and joined thereto by arcuate portions extending form opposite ends thereof, said clip further having latching means including a detent on said central leg; and

(b) a chair having a body including jaw means defining a lip for receiving said clip in latching engagement therewith, latching means on said body including a mating protuberance on the lip of said chair for securing said clip on said chair when the former is driven into engagement with the latter, and anchor means for securing said body proximate the base flange of a railway rail supported on the tie plate, said anchor means including at least one downwardly depending leg configured to pass through a spike hole in a conventional tie plate affixed to a wooden tie.



4,953,788

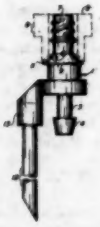
WATER SPRAY FITTING

Albert F. Hansen, Punga Grove, New Zealand, assignor to Hansen Developments Limited, Punga Grove, New Zealand

Filed Sep. 30, 1988, Ser. No. 252,242

Int. Cl.[5] B05B *15/02, 1/14*

U.S. Cl. 239—107 **7 Claims**



3. A miniature plastic moulded irrigation spray fitting, comprising a body part and a cap part, the body part comprising an upright portion carrying threads and a skirt portion extending about the base of the upright portion and providing a downwardly directed annular face extending about the base of the upright portion, the cap part comprising a gripping portion about the exterior of the cap part and being adapted to threadedly mount on the body part and comprising an annular face about the base of the cap part arranged to engage the body part face when the cap part is screwed home on the body part, and at lest one of either the body part face or cap part face having at least one groove extending across the face from a water supply port from the interior to the exterior of the body part adjacent said face, such that a spray outlet of the fitting is defined when the cap part is screwed home onto the body part, whereby said spray outlet may be opened for cleaning by loosening of the cap part on the body part.

4,953,789

ARRANGEMENT FOR THE METERED SUPPLY OF A FUEL, ESPECIALLY INTO THE COMBUSTION SPACE OF AN INTERNAL COMBUSTION ENGINE

Wolfgang Strobl, Eichstaett; Walter Peschka, Sindelfingen, and Gottfried Schneider, Stuttgart, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

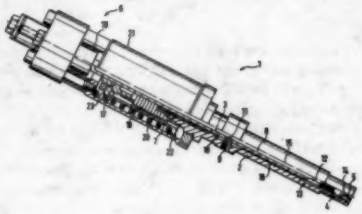
PCT No. PCT/EP87/00247, § 371 Date Jan. 22, 1988, § 102(e) Date Jan. 22, 1988, PCT Pub. No. WO87/07336, PCT Pub. Date Dec. 3, 1987

PCT Filed May 13, 1987, Ser. No. 190,687

Claims priority, application Fed. Rep. of Germany, May 22, 1986, 3617255

Int. Cl.[5] B05B *15/00*

U.S. Cl. 239—132.5 **16 Claims**



1. An arrangement for the metered feeding of a fuel, especially into the combustion space on an internal combustion engine comprising:

a valve body means having a discharge opening at its distal end arranged downstream of a valve seat;

a valve for engaging the valve seat to close the discharge opening and actuated by movement of a hollow stem means guided in the valve body means by guide means, the valve intermittently controlling the opening of the discharge opening by movement of the stem means away from the discharge opening;

a fuel reservoir chamber means, formed in the hollow stem means, which is connected by channels means arranged in the stem means with an overflow chamber upstream and adjacent the valve seat;

a fuel conducting connection which communicates with an inflow chamber adjacent the proximal end of the valve body means;

the valve body means and stem means being sized to form a gap therebetween which connects the inflow chamber to the overflow chamber in a fuel conducting manner at least when the valve is moved to open the discharge opening; and

at least one radial opening in the stem means, adjacent the inflow chamber of the fuel-conducting connection for conducting fuel to the fuel reservoir chamber of the stem means.

4,953,790

LOW COST APPLICATOR AND METHOD OF USE

John E. Waldrum, 349 Fairview Ave., Ambler, Pa. 19002

Filed Oct. 3, 1988, Ser. No. 252,784

Int. Cl.[5] B05B *9/08*

U.S. Cl. 239—154 **6 Claims**

1. The method of using a low cost sprayer of the type comprising a length of flexible hose, the hose having an inlet and an outlet and a nozzle secured to the hose outlet comprising

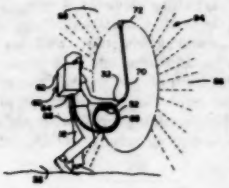
placing the hose inlet end into an agricultural chemical containing tank;

elevating a portion of the hose and the nozzle above the tank; and

rotating the portion of the hose and the nozzle through an

arc of three hundred and sixty degrees to cause agricultural chemical flow through the nozzle;

moving the tank while rotating the portion of the hose and the nozzle; and



rotating the nozzle at non-uniform velocity through the arc of rotation.

4,953,791

MANUALLY OPERATED TRIGGER TYPE DISPENSER, METHOD OF ASSEMBLING THE SAME, AND A SPINNER FOR USE IN THE DISPENSER

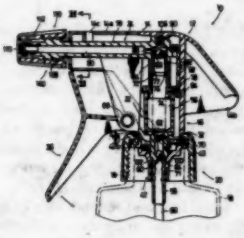
Atsushi Tada, 2-6-3 Kakinokizaka, Meguro-ku, Tokyo, Japan

Division of Ser. No. 169,776. This application Dec. 18, 1989, Ser. No. 452,803

Claims priority, application Japan, Apr. 24, 1987, 62-101265; Aug. 11, 1987, 62-200149; Nov. 12, 1987, 62-286226; Nov. 30, 1987, 62-302816; Feb. 5, 1988, 63-25233

Int. Cl.[5] B05B *9/043*

U.S. Cl. 239—333 **7 Claims**



1. A manually operated trigger type dispenser, comprising:

a dispenser body including an upper portion and a lower portion vertically extending from the upper portion;

a bottle cap for detachable coupling the lower portion of said dispenser body with a neck of a container filled with a liquid to be dispensed;

a cylinder defining a pump chamber and engaged with a back portion of a swingable trigger, so as to reciprocate between an upper operation-position and a lower non-operation position when said trigger is squeezed and released;

a substantially L-shaped piston made of a synthetic resin and including a horizontal nozzle interposed within the upper portion of said dispenser body, and a vertical piston body located within the lower portion of said dispenser body, for guiding said cylinder;

a nozzle cap having an orifice and attached to a distal end of the nozzle of said piston; and

a return spring biasing said cylinder to the lower non-operation position thereof;

the nozzle of said piston including a pair of plates each unitarily formed with said nozzle via a hinge, a hole being formed in each lower end portion of the plates, in which a pair of pins projecting from inner surfaces of said trigger being loosely fitted, for pivotally attaching said trigger to said nozzle.

4,953,792

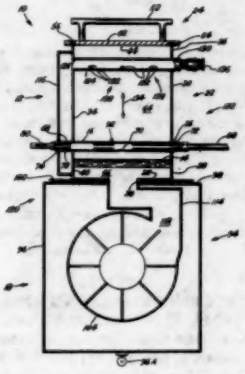
DRY POWDER APPLICATOR

William E. Evans, Jacksonville, Fla., assignor to Roussel Bio Corporation, Englewood Cliffs, N.J.

Filed Feb. 10, 1989, Ser. No. 309,282

Int. Cl.[5] B65G *53/38*

U.S. Cl. 239—654 **7 Claims**



1. An apparatus for dispensing a powdered material comprising, in combination:

a housing adapted to receive said powdered material;

a fluidizing medium positioned within said housing so as to define a lower expansion chamber and an upper hopper chamber;

a dusting duct extending through said upper hopper chamber and including a fluid inlet external to said housing, a powder inlet within said housing, and a dusting outlet external to said housing, said powder inlet having a substantially downward orientation;

blower means for generating a mixture fluid flow into said expansion chamber and a dispersion fluid flow into said fluid inlet, said mixture fluid flow passing through said fluidizing medium to create a fluidized bed of said powdered material within said hopper chamber; and

dispenser means, in communication with said dusting outlet, for selectively dispensing said powdered material, said dispenser means having an open state for dispensing and a closed state;

said dispersion fluid flow passing through said dusting outlet at a predetermined flow rate and drawing said fluidized bed at a predetermined mixture rate through said powder inlet to create a powdered stream whenever said dispenser means is in said open state;

said dispersion fluid flow passing through said powder inlet into said upper hopper chamber whenever said dispensing means is in said closed state to purge said powder inlet of said powdered material accumulated therein, whereby clogging thereof is substantially avoided.

4,953,793

BOWL-AND-ROLLER MILL

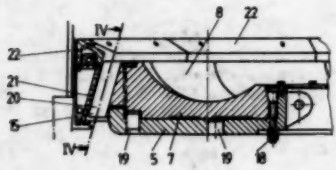
Dieter Kiefer, Wesel-Bislich, and Helmut Grommes, Duisburg, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jun. 29, 1989, Ser. No. 373,986

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822290

Int. Cl.[5] B02C *15/00*

U.S. Cl. 241—119 1 Claim



1. A roller bowl mill comprising: a housing; a rotating grinding bowl in said housing; said grinding bowl having a replaceable grinding track element attached to said grinding bowl; stationary rollers rolling over said grinding track element; said grinding track element comprising individual grinding bowl segments; a nozzle ring surrounding said grinding bowl; said nozzle ring being formed of nozzle ring segments; blades on said nozzle ring; said blades being formed on the outer periphery of the individual grinding bowl segments; each grinding bowl segment forming with a corresponding nozzle ring segment a single replaceable and interchangeable part.

4,953,794

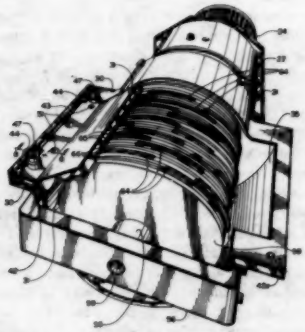
SINGLE PROCESS DESINEWING AND DEBONING MACHINE AND METHOD

Stephen A. Paoli, 1006 Highview Ave., Rockford, Ill. 61108

Continuation-in-part of Ser. No. 511,102, Ser. No. 695,137, and Ser. No. 820,248. This application May 4, 1987, Ser. No. 46,435

Int. Cl.[5] B02C *19/12*

U.S. Cl. 241—24 20 Claims



1. A method of mechanically separating meat from an agglomeration of waste material said method comprising the steps of:

(a) feeding said agglomeration and meat to a rotor having closely spaced helical cutting elements;

(b) engaging said agglomeration and meat with a plurality of cutting teeth on certain of said helical cutting elements extending in planes substantially perpendicular to the rotor axis;

(c) forcing said agglomeration and meat between a breaker bar and said rotor into a wedge shaped pocket of progressively decreasing thickness in the direction of rotation of the rotor; and

(d) said breaker bar having a plurality of parallel grooves and teeth registering interdigitally with the cutting teeth of said helical cutting elements, whereby the meat is separated from the waste material by pulling, cutting, pressing, and wedging said agglomeration and meat by forcing said agglomeration and meat into said wedge shaped pocket between the teeth of said breaker bar, moving the meat through the helical cutting elements into a collecting receptacle, and retaining the waste material on the outside of said helical cutting elements which eject it into a waste receptacle.

4,953,795

WOOD CHIP CRACKING APPARATUS

Joseph Bielagus, Tualatin, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 24, 1988, Ser. No. 261,455

Int. Cl.[5] B02C *4/30*

U.S. Cl. 241—159 20 Claims

1. An apparatus for destructuring wood chips comprising;

first and second rolls disposed for rotational operation substantially parallel to each other, and spaced from each other a preselected distance for applying compressive force to wood chips passing therebetween,

means for supplying a flow of wood chips to said first and second rolls and for distributing the wood chips along the axial extent of said first and second rolls,

at least one of said first and second rolls being connected to means for rotating said at least one roll about its longitudinal axis,

at least one of said rolls having an aggressively contoured roll surface including a matrix of outwardly extending discrete projections, said projections being of a height substantially equivalent to the desired chip thickness, causing said chips to be cracked primarily in a direction parallel to the chip fibers as compressive force is applied thereto when the chips pass between said first and second rolls.

4,953,796

REFINER SEGMENT

Nils Virving, Vällingby, Sweden, assignor to Sunds Defibrator Aktiebolag, Sweden

PCT No. PCT/SE88/00076, § 371 Date Jun. 27, 1989, § 102(e) Date Jun. 27, 1989, PCT Pub. No. WO88/06490, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 23, 1988, Ser. No. 378,224

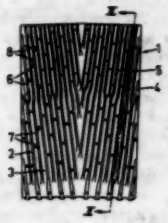
Claims priority, application Sweden, Feb. 25, 1987, 8700790

Int. Cl.[5] B02C *7/12*

U.S. Cl. 241—298 7 Claims

1. An improved disc refiner for refining fibrous materials, said disc refiner having a refiner segment formed with a pattern including a plurality of radially disposed bars having an upper surface, a plurality of grooves radially disposed interme-

diate said bars, and a plurality of flow restrictions traversing said grooves between adjacent ones of said bars and extending upward in said grooves to said upper surfaces of said adjacent



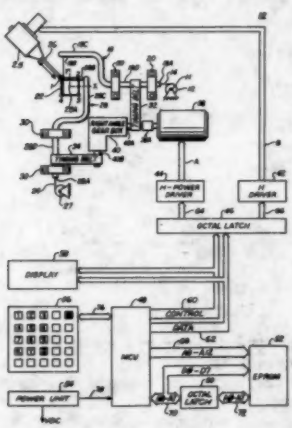
ones of said bars, at least one of said bars including connecting means for enabling direct communication between a pair of said grooves adjacent said at least one of said bars.

4,953,797

WOVEN CROSS-COIL WINDING SYSTEM

Paul A. Markow, Huntsville, and William Nolle, Hazel Green, both of Ala., assignors to Acustar, Inc., Troy, Mich.

Filed Nov. 16, 1989, Ser. No. 437,236
Int. Cl.[5] H02K *15/00*
U.S. Cl. 242—7.11 **6 Claims**



1. Winding system for weaving a pair of orthogonally positioned stator coils about a non-metallic, coil-bobbin, square frame, the frame having four corner post, four side walls and a central region containing a non-metallic rotor chamber housing a permanent magnet rotor, the rotor having a shaft extending from a centroid of the rotor and through a port of the chamber in the direction of the posts, the centroid being located at an origin of an X—Y coordinate axis plane with a first, second, third and fourth post (counting in a clockwise manner about the origin) positioned at a location in a quadrant bound by a positive Y and a negative X axis, a positive Y and a positive X axis, s negative Y and a positive X axis, and a negative Y and a negative X axis respectively, said system comprising:

(a) first winding means for winding a first length of wire about a perimeter of the frame in a spiral-type, counterclockwise motion from a first post in a positive X-axis direction to within the location of said second and third posts and then in a negative X-axis direction towards said first and fourth posts;

(b) second winding means coupled to said first winding means for winding a second length of wire about the perimeter of the frame in a spiral-type, clockwise motion from said second post in a negative Y-axis direction to within the location of said third and fourth posts and then in a positive Y-axis direction towards said first and third posts, said second winding means winding said second length of wire simultaneously with said first winding means winding said first length of wire such that at each revolution of the winding of the wires, said first wire interlaces with the second wire in a planes perpendicular to said bobbin shaft about a top and a lower surface of said bobbin;

(c) bobbin positioning means having a retractable shaft coupled to the first post of said bobbin for repositioning the bobbin after each revolution of the winding that interlaces the first length of wire with the second length of wire, said shaft being repositioned along a path extending 45 degrees from the origin of the X—Y axis plane in a quadrant bound by the negative X and positive Y-axis in a manner that causes the centroid of the bobbin to move in a negative X-axis direction to cause placements of interlaced first and second lengths of wire over the bobbin to form a layer of interlaced windings and thereafter to move in a positive X-direction to cause: placements of interlaced first and second lengths of wire over the layer to form another layer over the layer, the movements in the negative and positive directions along the X-axis being repeated until the stator coils are completed; and

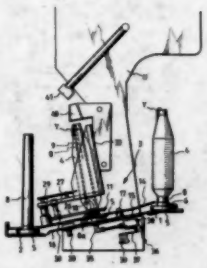
(d) computer control means coupled to said first winding means and said bobbin positioning means for providing logic control and command signals for controlling winding a revolution of the interlaced winding and for controlling repositioning the bobbin after each completion of the revolution of the interlaced winding.

4,953,798

WINDING UNIT

Shoichi Tone, Kyoto, and Masaharu Kiriake, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Mar. 9, 1989, Ser. No. 321,525
Claims priority, application Japan, Mar. 17, 1988, 63-64198
Int. Cl.[5] B65H *54/20, 67/02*
U.S. Cl. 242—35.5 R **6 Claims**



1. In a winding unit operable with a bobbin and feeding means for feeding the bobbin to a winding position to be unwound, apparatus comprising:

a tray having a peg on which the bobbin is supported as the bobbin is fed to the winding position; and

a bobbin dislodgement preventing means provided adjacent the winding position for contacting the exterior of the bobbin take-up tube to thereby prevent the bobbin from being dislodged from the peg as the bobbin is unwound.

4,953,799
CUTTING APPARATUS FOR SEVERING TRAILING YARNS ON SPINNING BOBBINS

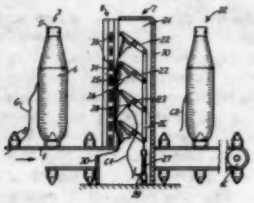
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Sep. 6, 1989, Ser. No. 403,701

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1988, 8811305[U]

Int. Cl.[5] B65H *54/22*

U.S. Cl. 242—35.6 E **8 Claims**



1. Cutting assembly, comprising a transport apparatus transporting spinning bobbins upright on mandrels along a transport route, a cutting apparatus disposed at a given level on one side of said transport apparatus for severing trailing yarns on the bobbins, and a feeder disposed at said given level on the opposite side of said transport apparatus for feeding the trailing yarns to said cutting apparatus.

4,953,800
YARN WINDING DEVICE

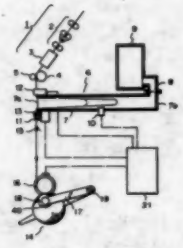
Tadahiko Okubo; Jun Takagi, and Tadashi Kohara, all of Otsu, Japan, assignors to Toray Engineering Co., Ltd., Osaka, Japan

Continuation of Ser. No. 414,584, is a continuation of Ser. No. 143,938, Jan. 14, 1988, abandoned. This application Jan. 31, 1990, Ser. No. 473,114

Claims priority, application Japan, Jan. 16, 1987, 62-008828; Aug. 17, 1987, 62-204407

Int. Cl.[5] B65H *59/38*

U.S. Cl. 242—45 **23 Claims**



1. A yarn winding device which comprises:

yarn feeding means for feeding a yarn at a predetermined speed,

yarn winding means for winding the yarn on a bobbin while traversing said yarn back and forth across the bobbin,

absorbing means located between the yarn feeding means and the winding means for absorbing variations in the winding speed of the yarn fed from the yarn feeding means by storing the yarn therein in a U-shaped loop, said absorbing means comprising a vacuum box and means for creating a negative pressure therein, whereby the loop of the yarn is pulled into the box by a suction air flow created by the negative pressure,

detecting means generating a signal in response to the presence or lack of presence of the yarn loop in the absorbing means,

tensioning means for mechanically applying a predetermined tension to the yarn located downstream of the absorbing means, and

control means for controlling the yarn winding speed of the yarn winding means in response to signals from the yarn detecting means wherein when the detecting means signals the presence of the yarn loop in the absorbing means, the control means operates the winding means at a higher yarn winding speed in which the yarn winding speed is higher than the speed at which the yarn is fed by the yarn feeding means at a predetermined constant ratio and when the detecting means signals the lack of the presence of the yarn loop in the absorbing means, the control means operates the yarn winding means at a lower yarn winding speed in which the average yarn winding speed is lower than the speed at which the yarn is fed by the feeding means.

4,953,801
CLIP

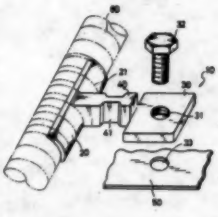
Ryuetsu Oikawa, Kosai, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 261,898

Claims priority, application Japan, Oct. 28, 1987, 62-164734[U]

Int. Cl.[5] F16L *3/08*

U.S. Cl. 248—65 **12 Claims**



1. A clip adapted to support a wiring harness to a support structure comprising:

a holder head portion for longitudinally gripping the wiring harness;

a retainer stem portion for securing the clip to the support structure; and

a flexible bridging portion, including end portions and a flexible portion intermediate the end portions, said bridging portion for connecting the holder head portion to the retaining stem portion, being resiliently bendable from a first position, in which the bridging portion is straight and perpendicular to the gripped wiring harness, to a second position, in which the bridging portion is configured at approximately a 90 (ninety) degree angle, whereby the retaining stem portion may be positioned adjacent to the wiring harness to decrease the overall transverse dimension of the clip during installation of the clip through a hole in the support structure said flexible bridging portion having opposed generally parallel walls establishing an overall thickness dimension from end to end sufficient to rigidly support the holder head portion in a direction perpendicular to the transverse dimension of the clip and said flexible intermediate portion having a reduced thickness in the transverse direction for imparting flexibility thereto.

4,953,802

METHOD OF MOUNTING CHUCK STRUCTURES

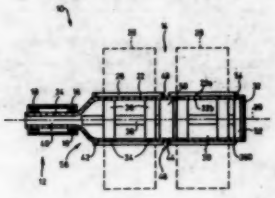
Peter Busenhart, Winterthur, Switzerland; Ruedi Schneeberger, Turbenthal, Switzerland; Erwin Holbein, Spartanburg, S.C.; Armin Wirz, Ossingen, Switzerland; Adolf Flüeli, and Hansueli Maier, both of Winterthur, Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Continuation of Ser. No. 911,816, Sep. 26, 1986, Pat. No. 4,811,910. This application Dec. 2, 1988, Ser. No. 279,184

Claims priority, application United Kingdom, Oct. 2, 1985, 8524303

Int. Cl.[5] B65H *54/547*

U.S. Cl. 242—46.2 8 Claims



1. A method of mounting a chuck structure of a high speed winder comprising the steps of:

providing a chuck having a first elongated tubular portion which possesses a wall having substantially constant wall thickness throughout substantially its entire length and thereby defining an internal chamber, and an external circumference adapted to receive one or more bobbin tubes for rotation about an axis of rotation to enable formation of one or more packages in use, and a second elongated tubular portion integral with said first elongated tubular portion and of reduced external diameter relative thereto;

inserting, through one end of said first elongated tubular portion remote from said second elongated tubular portion, into said internal chamber of said first elongated tubular portion, internal elements containing bobbin tube engaging elements reversibly displaceable through openings in said wall of said first elongated tubular portion for releasably holding said one or more bobbin tubes at said external circumference of said first elongated tubular portion; and

mounting unsplit bearing means at said second elongated tubular portion such that said first elongate tubular portion and said second elongated tubular portion are rotatable about said axis of rotation.

4,953,803

FILAMENT WINDING APPARATUS

George W. LeCompte, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 28, 1989, Ser. No. 316,614

Int. Cl.[5] B65H *54/02*

U.S. Cl. 242—47 6 Claims

1. Apparatus for winding a filament onto a tubular bobbin; said apparatus comprising:

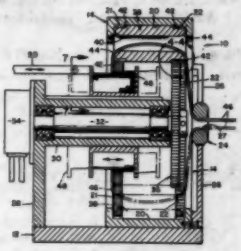
a cylindrical case, having a longitudinal axis, a base plate, said case having an inner wall surface formed into a continuous circumferentially extending groove having gear teeth arranged therelong;

an eyelet secured to the case with the eyelet opening lying on the axis of the cylindrical case;

a sun gear mounted within the case for rotation about an axis colinear with the axis of the cylindrical case and the gear teeth of said sun gear lying directly opposite the case groove;

means for rotating the sun gear; and

a tubular bail having a set of teeth on an outer surface for meshing with the sun gear, the dimensions of the bail being such as to simultaneously mesh with the gear teeth in the case groove;



means for mounting a bobbin colinear with the axis of the case;

such that the filament passes through the eyelet and the tubular bail prior to being wound on a bobbin.

4,953,804

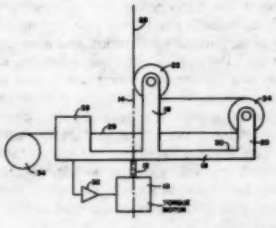
ACTIVE LAG ANGLE DEVICE

Troy L. Hester, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 2, 1990, Ser. No. 502,968

Int. Cl.[5] B65H *54/02, 54/28, 57/28*

U.S. Cl. 242—47 3 Claims



1. An active lag angle device for an optical fiber being wound on a bobbin comprising a torque motor with a housing thereof adapted to be fixedly mounted, said torque motor having a rotary output shaft projecting therefrom, a reference surface structure secured to said shaft and being integral therewith, said reference surface structure having an outrigger pulley mounted at one end thereof, a guide pulley mounted on said reference surface structure at an intermediate section thereof with the circumferential surface of the guide pulley being tangent to a center line axis of the rotary output shaft, and the opposite end of said reference surface structure from said outrigger pulley having a position sensor mounted thereat, said position sensor sensing deviations of an optical fiber when the optical fiber is positioned along said axis to said guide pulley is turned 90° by said pulley to said outrigger pulley which turns the optical fiber 180° to position the optical fiber above a predetermined reference line on said reference surface structure and producing output signals for controlling the torque motor to maintain the optical fiber relative to said reference line.

4,953,805

METHOD OF AND APPARATUS FOR DELIVERING WEBS OF PHOTOSENSITIVE MATERIAL TO A PRINTER

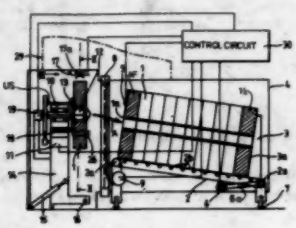
Hans-Jürgen Rauh, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,101

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740806

Int. Cl.[5] B65H *19/12*

U.S. Cl. 242—58.6 **32 Claims**



8. Apparatus for delivering to a processing machine, such as a printer, successive webs of photosensitive material which are convoluted on cores and form therewith rolls and each of which has a leader, comprising a conveyor defining a sloping path and arranged to support a stack which consists of coaxial rolls and has an axis which is slightly inclined to the horizontal so that the stack has a topmost roll which is located at a predetermined level and a lowermost roll, said conveyor having means for propping the lowermost roll of the stack in said path against overturning under the action of gravity and/or under the weight of other rolls in the stack; means defining an unwinding station which is spaced apart from the topmost roll at said level; means for transferring the topmost roll of the stack to said station, including a rotary transfer member movable between a first position at said station and a second position of engagement with the core of the topmost roll at said level, and means for moving the transfer member between said positions; means for unwinding the web from the core of the roll at said station, including means for rotating the core; means for threading the leader of the web at said station into the processing machine; means for expelling the core from said station upon completed unwinding of the web therefrom; and means for advancing the conveyor so as to advance successive rolls to said predetermined level upon completed transfer of topmost rolls from said path.

4,953,806

WINDING REEL FOR ROLLED STRIP

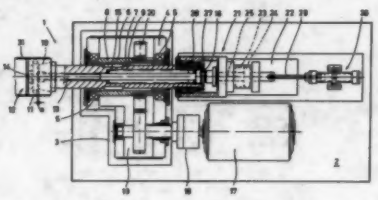
Manfred Rothenpieler, Siegen, and Wolfgang Moos, Freuztal, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 98,777, Sep. 17, 1987, abandoned, which is a continuation of Ser. No. 823,622, Jan. 29, 1986, abandoned. This application Apr. 12, 1989, Ser. No. 338,404

Int. Cl.[5] B21C *47/30*

U.S. Cl. 242—72.1 **7 Claims**

1. A reel for winding and unwinding rolled strip on a coil, the strip having a center, comprising a drum including a plurality of segments movable between a first position of rest and a second spread-apart position, said segments defining conically shaped sliding surfaces, a stationary reel housing, a tubular drive shaft mounted rotatably and axially immovably in said housing, a tubular reel shaft having an axis and an end facing said drum, said end defining conically shaped surfaces contacting said sliding surfaces of said segments, said tubular reel shaft mounted in said tubular drive shaft, said tubular reel shaft having axially extending splines and said tubular drive shaft defining axially extending grooves engaged by said splines, so that said tubular reel shaft is rotatable together with said tubular drive shaft in said reel housing and axially slidable relative to said tubular drive shaft, a plunger mounted in said tubular reel shaft, a flange attached to said plunger for connecting said plunger to said segments, a compression spring surrounding said plunger, said spring acting on said tubular reel shaft and said plunger in axial direction for biasing said segments into said spread-apart position, wherein said segments are moved between said first and second position by an axial movement of said tubular reel shaft, a non-rotating, axially movable positioning drive formed by a piston-cylinder unit including a first piston rod, the positioning drive effecting a relative axial movement between said tubular reel shaft and said plunger for moving said segments from said spread-apart position against the force of said compression spring to said position of rest and a stationary displacement drive formed by a piston-cylinder unit including a second piston rod for axially moving said drum in and out relative to the coil and to effect an adjustment relative to the strip center, said first and second piston rods connected to each other and configured to hold said plunger and said segments in fixed axial position during the movement of said segments between said first and second position.



4,953,807

STATIONARY TAPE GUIDE FOR A MAGNETIC TAPE RECORDER

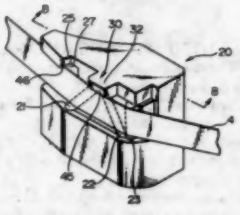
Yoshihiro Noguchi, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Nov. 4, 1988, Ser. No. 267,488

Claims priority, application Japan, Nov. 6, 1987, 62-169939[U]

Int. Cl.[5] B65H *23/10, 27/00*

U.S. Cl. 242—76 **6 Claims**



1. A stationary tape guide, for use with a magnetic tape recorder having an inclined cylinder mounted on a chassis, the tape-guide comprising a guide block mounted on the chassis having;

a first tape surface guide inclined with respect to a first reference plane;

a second tape surface guide inclined with respect to the first reference plane and located further from the inclined cylinder than the first tape surface guide;

a third tape surface guide oriented orthogonal to the first reference plane and located further from the inclined cylinder than the second tape surface guide;

a first tape edge guide extending from the guide block beyond a second reference plane defined by the first and second tape-surface guides and having a first tape edge contact surface;

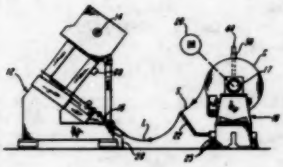
a second tape edge guide extending from the guide block beyond a third reference plane defined by the first tape surface guide in cooperation with the cylinder, and having a second tape edge contact surface which is located further from the first reference plane than the first tape-edge contact surface.

4,953,808

APPARATUS FOR SUPPLYING A SHEET METAL STRIP TO A PRESS

Michael R. Craycraft, Piqua, Ohio, assignor to Perfecto Industries, Inc., Piqua, Ohio

Filed Aug. 8, 1988, Ser. No. 229,348
Int. Cl.[5] B65H *59/00, 23/22*
U.S. Cl. 242—78.6 **15 Claims**



1. Apparatus for controlling the feeding of a strip of metal from a supply coil on a pay-off reel to a reciprocating press requiring intermittent and incremental advancement of the strip into the press, said apparatus comprising a variable speed drive connected to feed the strip from the coil, strip speed sensing means for detecting the rate of longitudinal movement of the strip being fed from the supply coil in response to operation of said drive, strip feeding means for intermittently advancing the strip in successive increments into the press, press sensing means for detecting the rate of reciprocating operation of the press, loop sensing means for detecting elevation changes in the bottom of a generally U-shaped loop formed in the strip between said strip speed sensing means and said strip feeding means, and computer control means connected for automatically changing the speed of said drive in response to signals received from said loop sensing means, said press sensing means and said strip speed sensing means.

4,953,809

MICROPHONE RETRIEVAL DEVICE

Stephen D. Barrus, 52 Afton, Rochester, N.Y. 14612

Filed Jun. 20, 1989, Ser. No. 369,082
Int. Cl.[5] B65H *75/48*
U.S. Cl. 242—107.300 **17 Claims**

1. An apparatus for retrieving a microphone, comprised of:

(a) an extendable and retractable body assembly;

(b) means for extendably connecting said body assembly to an interior surface of a vehicle;

(c) means for removably attaching a microphone to said body assembly;

(d) a line cord attached to said body assembly, wherein said cord comprises a first end and a second end, and wherein said first end of said line cord is attached to said body assembly;

(e) means for attaching said second end of said line cord to an interior surface of a vehicle;

(f) means for imparting tension to said line cord, which means are disposed within said body assembly;

(g) means for adjusting the amount of tension imparted to said line cord, which means are disposed within said body assembly;

(h) means for retracting said line cord into said body assembly of said apparatus, which means are disposed within said body assembly; and

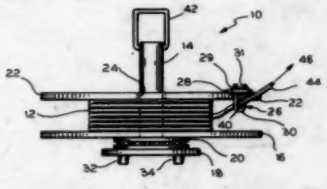
(i) means for slowing the rate of retraction of said line cord into said body assembly, which means are disposed within said body assembly.

4,953,810

HOLDER AND DISPENSER FOR A COILED ARTICLE

Allen L. Stadig, R.F.D. #1, Box 1103, Soldier Pond, Me. 04781

Filed Feb. 8, 1990, Ser. No. 476,688
Int. Cl.[5] B65H *49/28*
U.S. Cl. 242—129 **11 Claims**



1. A device for holding and dispensing a coiled article comprising:

a rotatable turntable having a support surface;

a post extending co-axially from said turntable;

a plate mounted co-axially on said post parallel to said support surface of said turntable for slidable movement toward and away from said turntable; and

means associated with said plate for guiding said coiled article during dispensing and for braking the rotation of said turntable upon cessation of said dispensing.

4,953,811

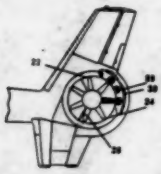
SELF-DRIVING HELICOPTER TAIL ROTOR

Bert J. Smith, Gloucester Point, Va., assignor to The United States of America as Represented by the Secretary of the Army, Alexandria, Va.

Filed Oct. 19, 1988, Ser. No. 260,209
Int. Cl.[5] B64C *27/82*
U.S. Cl. 244—17.19 **3 Claims**

1. A tail rotor propulsion apparatus for a helicopter comprising a plurality of rotor blades connected at their root ends to a shaft to form a tail rotor, bearing means, retaining means securing the tail rotor shaft in the bearing means so that the tail rotor freely rotates, a circumferential housing surrounding the arc described by the rotating tail rotor blades, permanent magnets generating magnetic flux, means attaching the permanent magnets to the tip of each rotor blade, primary winding coils mounted within the circumferential housing so that their flux forms a properly oriented traveling-wave field to coact with

the flux from the permanent magnets, means for commutating the field windings in sequence to produce in the primary windings a traveling-wave field, electrical means energizing the primary windings so that the traveling-wave field forms a high reluctance flux path which coacts with the magnetic flux of the



permanent magnets in the rotor blade tips, saliency thus produced, converting the rotor into both a reluctance motor and a self-driving tail rotor as a result of the pulsation of flux imposed by cyclic variation in the reluctance of a magnetic circuit.

4,953,812

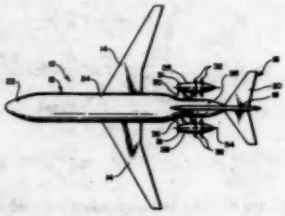
AIRCRAFT CONFIGURATION WITH AFT MOUNTED ENGINES AND METHOD

Antonius J. Van der Hoeven, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 13, 1987, Ser. No. 120,587

Int. Cl.[5] B64D *27/20*

U.S. Cl. 244—55 **13 Claims**



1. A method of designing an aircraft, where the aircraft comprises:

(a) a fuselage having a longitudinal center axis, a forward portion, an intermediate main portion, and a rear portion,

(b) first and second engines mounted adjacent to an exterior surface of said rear portion, said engines having first and second propeller means at first and second propeller locations, said propeller means being arranged to rotate about first and second propeller axes, respectively, with each propeller axis having a substantial alignment component parallel to said longitudinal axis,

(c) said fuselage having first and second longitudinally extending surface portions which extend lengthwise along said rear fuselage portion and which are adjacent to said first and second propeller means, respectively,

said method comprising:

(a) establishing longitudinally extending reference contours for each surface portion, where each contour creates an optimized pressure distribution pattern over the side surface portions under conditions where the propeller means are absent,

(b) identifying modified pressure distribution patterns over said surface portions, which modified pressure distribution patterns result from placing and operating the propeller means at said propeller locations to create thrust,

(c) recontouring the side surface portions from the reference contours to actual contours to create pressure effects which counteract adverse pressure effects created by the thrusting propellers being present so as to bring the pressure distribution pattern over the side surface portions more closely to the optimized pattern, said actual contours of the side surface portions being characterized in that forward regions of the surface portions slant rearwardly and inwardly toward said longitudinal center axis at a relatively greater angle relative to said longitudinal axis and curve concavely to join their related intermediate regions which are more in alignment with said longitudinal center axis relative to their related forward surface regions, the intermediate regions joining to their related rear regions in a convex curve with each rear region slanting rearwardly and inwardly to a closure location.

4,953,813

EJECTABLE MEMBER WITH PARACHUTE

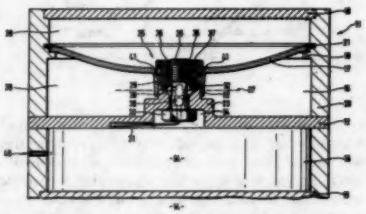
Gunter Postler, Rothenbach/Peg.; Erich Bock, Nuremberg; Wolfgang von Entress-Furstenecк, Leinburg, and Werner Rudenauer, Roth, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 29, 1988, Ser. No. 291,688

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800330

Int. Cl.[5] B09D *17/00*

U.S. Cl. 244—147 **12 Claims**



1. An ejectable member having a storage space for a parachute; a rear wall on said ejectable member; a cassette for said parachute rearwardly of said rear wall; a pyrotechnically severable connector element for centrally axially clamping said cassette to said rear wall, said storage space for said parachute being separated in the region of a predetermined plane of separation from said pyrotechnically severable connector element by a telescopable seal with a sleeve.

4,953,814

RAILWAY SWITCH COMPRISING A FROG HAVING A MOVABLE MAIN POINT AND AUXILIARY POINT

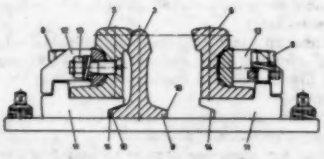
Johannes R. Oswald, Zeltweg, and Eduard Guggenberger, Weiskirchen, both of Austria, assignors to Voest-Alpine Maschinenbau Gesellshaft m.b.H., Linz, Austria

Filed May 17, 1989, Ser. No. 353,022

Claims priority, application Austria, May 20, 1988, 1340/88

Int. Cl.[5] E01B *7/00, 7/22*

U.S. Cl. 246—382 **5 Claims**



1. A railway switch comprising a frog with a movable main

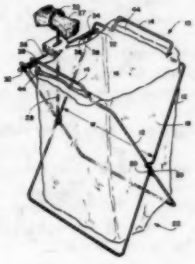
point and a movable auxiliary point, the main and the auxiliary points being formed of standard rail sections having a thick web, a first height and a rail foot, said railway switch further comprising outer wing rails being formed of asymmetric tongue sections having a second height, said second height being less than said first height, with said outer wing rails being at least partially fixed on base plates.

4,953,815

FOLDABLE RACK FOR POSITIONING A PLASTIC BAG AS A RECEPTACLE AND FOR SPARE BAG STORAGE

Norman Beymer, P.O. Box 126714, San Diego, Calif. 92112-6714, and Gary W. Kite, 422 Wolford Dr., Spring Valley, Calif. 92077

Filed Dec. 7, 1989, Ser. No. 447,041
Int. Cl.[5] B65B *67/12*
U.S. Cl. 248—97 **7 Claims**



1. A rack for supporting pliable bags having an open top comprising:

a pair of rectangular formed closed wire loops, each of said loops having opposing S shaped bends angularly offset from the plane of said loops along opposite side thereof and a centrally positioned coplanar protuding rectangular ear formed on one end of each of said loops, when the S shaped bends are reversed one to the other they interlock said loops together in a pivotable fashion with said ears adjacently opposing each other;

a removable locking member for locking said closed loops in substantially a maximum pivoted apart position, said locking member having two fixedly positioned arms in a cruciform configuration with one arm having a C shaped end for resting in the interlocked S bends and an end having a combined bag storage support and handle, the other arm of said locking member having locking means on each end thereof for securing said loops in a relative spaced apart position; and

a pliable bag with sits in adjacent sides thereof each of said slits being placed over one of said ears whereby said bag is supported in a substantially maximum top open condition for use as a receptacle.

4,953,816

NURSING BOTTLE HOLDER

Eileen Wilkinson, 12 Webb Rd., Naugatuck, Conn. 06770

Filed Jan. 19, 1989, Ser. No. 299,782
Int. Cl.[5] A47D *15/00*
U.S. Cl. 248—102 **12 Claims**

1. The combination comprising an infant safety seat having restraining means for releasably securing an infant in seated position thereon, a nursing bottle holder including a soft resilient flexible pad having front and rear surfaces, and fastening means for releasably attaching aid pad to the restraining means in a bottle supporting position in front of an infant releasably secured in seated position on the safety seat by the restraining means and including one fastener component attached to said rear surface and a mating fastener component attached to said restraining means for connecting engagement with said one fastener component, said pad including a chest shielding portion for substantially covering the frontal profile of the seated infant's chest when the pad is in its bottle supporting position, said pad having means for supporting a nursing bottle in a nursing position relative to the seated infant and including a pair of laterally spaced apart and upwardly projecting bottle retaining portions extending from the upper end of said chest

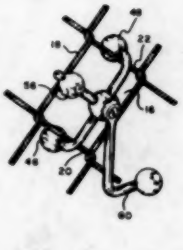
shielding portion, said bottle retaining portions defining an upwardly open bottle receiving yoke for cradlingly supporting a nursing bottle received therein in a nursing position with the longitudinal axis of the nursing bottle extending in a transverse direction relative to the plane of the pad when the pad is in its bottle supporting position, said bottle retaining portions frictionally engaging associated opposite side portions of a nursing bottle such as aforesaid cradled within said yoke.

4,953,817

CHAIN LINK FENCE HANGER

Peter Mosteller, 103 Linden Ave., Riverton, N.J. 08077

Filed Sep. 18, 1989, Ser. No. 408,863
Int. Cl.[5] A47F *7/00*
U.S. Cl. 248—222.2 **19 Claims**



1. A hanger for attaching items to a chain link type fence comprising:

a hub member, said hub member having a front, opposed sides and a top;

first and second opposed arms, each of said first and second arms being connected to said hub member and having main portions which extend generally outwardly from either side thereof, the free end of each of said first and second arms extending rearwardly such that said free ends are spaced apart but substantially parallel to each other;

a third arm connected to said hub and extending generally upwardly therefrom, said third arm having a main portion which is in substantially the same plane as but perpendicular to said main portions of said first and second arms, the free end of said third arm extending forwardly and downwardly,

said main portions of said first and second arms and said free ends thereof lying generally in a plane perpendicular to the main portion of said third arm, and

attaching means connected to and accessible from the front of said hub member for supporting articles when said hanger is secured to a fence.

4,953,818

HOLDER FOR BEVERAGE BOXES

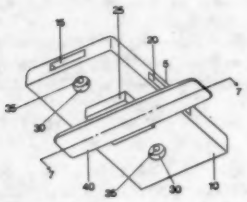
Bernard Contant, 731 Boul., Desaulniers, St.-Lambert, Qc, Canada J4P 1P7

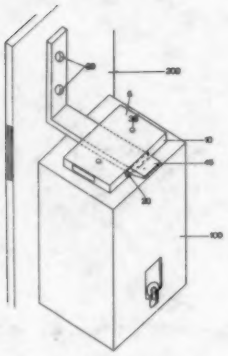
Filed Jul. 19, 1988, Ser. No. 221,214

Claims priority, application United Kingdom, Jul. 20, 1987, 8717127

Int. Cl.[5] B67D *5/06*

U.S. Cl. 248—222.3 **10 Claims**





1. A holder adapted to be mounted to a fixed supporting surface for holding a beverage box having a handle means on an upper surface thereof; said holder comprising:

a main portion, a support member having means for mounting said support member to a fixed supporting surface, and a bracket extending from said support member with inter-engaging means that releasably engage second engaging means provided on said main portion;

a generally elongated member having sharp ends secured to said main portion; and

said generally elongated member having means for engaging a handle means of a beverage box and for retaining a beverage box handle means on said elongated member by executing a 90° relative rotation between said main portion and a beverage box.

4,953,819

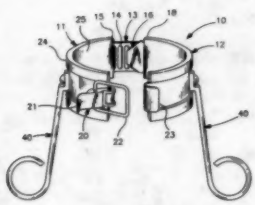
ADJUSTABLE SUPPORT CLAMP APPARATUS AND METHOD

Dale C. Davis, 2531 Bonita St., Lemon Grove, Calif. 92045

Filed Nov. 15, 1989, Ser. No. 437,024

Int. Cl.[5] A47B *96/06*

U.S. Cl. 248—230 **10 Claims**



1. A support clamp comprising:

a. two arcuate pliable bands;

b. an adjustably coacting connection at their first adjoining ends;

c. a coacting off-center tension clamp at their second adjoining ends;

d. a resilient pliable gasket secured to each of the two arcuate pliable bands;

e. a textured surface on the gasket; and

f. a plurality of supporting means attached to the arcuate pliable bands to support items.

4,953,820

LAMP WITH RETAINING RING

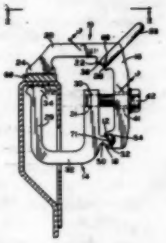
Ronald L. Yoder, Topeka, Ind., assignor to Universal Consolidated Methods, Inc., Topeka, Ind.

The portion of the term of this patent subsequent to Feb. 20, 2007 has been disclaimed

Continuation-in-part of Ser. No. 747,122, Jun. 20, 1985. This application Apr. 10, 1989, Ser. No. 335,222

Int. Cl.[5] B61D *45/00*

U.S. Cl. 248—231.5 **5 Claims**



5. An adjustable clamp having first and second members joined for limited pivotal relative motion about an axis, the first and second members having first and second pressure pads respectively with the pressure pads moving toward and away from one another as the first and second members are subjected to said relative pivotal motion, and a D-shaped retaining ring pivotably fixed to one of the members, the D-shaped ring including a straight segment and an arcuate segment, both segments being of generally circular cross-sectional configuration, and one of said members including a concave generally cylindrical channel for receiving the straight segment of the D-shaped ring with the ring pivoting about the axis of the cylindrical channel and the axis of said pivotal motion being parallel to the axis of the cylindrical channel, said first member comprising a generally uniform L-shaped cross-sectional con-

figuration with the first pressure pad near one end of the L, a portion of a hinge structure near the other end of the L, and the concave generally cylindrical channel intermediate the L ends, and the second member comprising a generally uniform cross-sectional configuration with the second pressure pad near one end and a second portion of a hinge structure adapted to slidingly mate with the portion of the hinge structure of the first member.

4,953,821

SUSPENSION APPARATUS FOR CONTROL DEVICES, CONTROL PANELS, OR THE LIKE

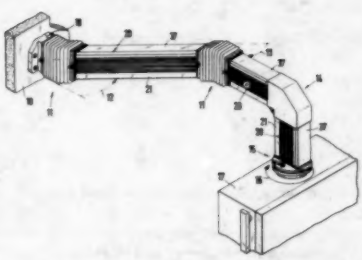
Wolfgang Reuter, Burbach-Wurgendorf; Jurgen Debus, Dietzholztal, and Lothar Lehr, Burbach-Oberdresselndorf, all of Fed. Rep. of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 313,224

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1988, 3805425

Int. Cl.[5] E04G *13/00*

U.S. Cl. 248—276 **21 Claims**



1. In a suspension apparatus for control devices and control panels which can be assembled from a connection flange and a connection rotary joint, support body sections, angle units, and intermediary joints connectable with a stationary body, and a coupling unit connectable with the control device and the control panel, the improvement comprising:

said support body sections (20) having an essentially U-shaped base profile section (21) which with a separating bar (25) parallel to a bar (22) is used to divide into a closed support part (TP) and an open U-shaped reception mounting part (AP) turned away from said bar (22);

a plurality of longitudinally directed connection bars (28, 29, 31, 32) having penetrating threaded reception mountings integrally formed on said support part (TP) and on said reception mounting part (AP);

a plurality of lateral limb sections (26, 27) of said reception mounting part (AP) proceeding into connection ends (33, 35) having longitudinally directed and penetrating rear-cut sections (34, 36); and

a cover profile section (37) having a U-shaped cross section and lateral limbs (38, 40) having longitudinally directed and penetrating suspension or locking attachments (39, 41) removably connectable with said connection ends (33, 35) of said reception mounting profile (AP), whereby said mounting profile (AP) can be closed.

4,953,822

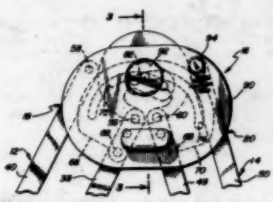
ADJUSTABLE ARM STRUCTURES

Jerry Sharber, Cypress, and Frank Kilby, Lawndale, both of Calif., assignors to Eldon Industries, Inc., Inglewood, Calif.

Continuation of Ser. No. 54,422, May 26, 1987, abandoned. This application Jun. 19, 1989, Ser. No. 368,913

Int. Cl.[5] E04G *3/00*

U.S. Cl. 248—281.1 **4 Claims**



1. An improved adjustable arm structure which includes first and second elongated arm assemblies located relative to one another so as to have adjacent ends and remote ends, a connecting joint means connecting the adjacent ends of said elongated arm assemblies, a mounting joint means for use in mounting said structure at the remote end of said first elongated arm assembly, each of said arm assemblies including first and second parallel links, said links of said first arm assembly being pivotally connected to said mounting joint means and said connecting joint means, said links of said second arm assembly being pivotally connected to a holding joint means and said connecting joint means, in which the improvement comprises:

said connecting joint means including a frame means, said links of said arm assemblies being pivotally connected to said frame means at different locations on said frame means;

said connecting joint means also including a first sector plate attached to a link of said first arm assembly and a second sector plate attached to a link of said second arm assembly, said sector plates extending parallel to one another, said sector plates overlying one another, and said sector plates containing arcuate slots which overlap each other in all positions of said sector plates whereby said arm assemblies may be independently moved and positioned relative to said connecting joint means;

said connecting joint means also including a bolt means extending through said arcuate slots of said sector plates for clamping and securing said sector plates within said frame means so as to hold said arm assemblies against movement by preventing any change in the distance between the links in said arm assemblies;

said bolt means being mounted on said frame means so as to be incapable of transverse movement relative to said frame means during the use of said arm structure whereby said bolt means will remain stationary during any movement of said arm assemblies and said arcuate slots

said bolt means further including a nut means for use in securing said sector plates by tightening and loosening said bolt means.

4,953,823

COASTER AND WIPE

William G. Sheaffer, and Robin L. Sheaffer, both of 4545 S. Mission Rd., lot 332, Tucson, Ariz. 85714

Filed Jul. 25, 1989, Ser. No. 385,308

Int. Cl.[5] A47G *91/00*

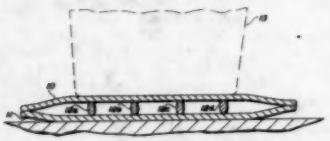
U.S. Cl. 248—346.1 **17 Claims**

1. A coaster/wipe comprising:

(a) a first layer of flexible absorbent material of a preselected first size;

(b) a second layer of flexible absorbent material having a size

substantially the same as the preselected first size, said second layer of flexible absorbent material being bound to the first layer of flexible absorbent material around its periphery thereof; and,



(c) at least two semi-rigid spacers positioned between said first layer of flexible absorbent material and the second layer of flexible absorbent material.

4,953,824

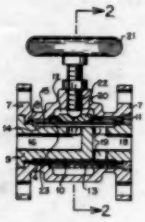
DEFLECTABLE SLEEVE TYPE VALVE

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Mar. 5, 1990, Ser. No. 488,627

Int. Cl.[5] F16K *7/06*

U.S. Cl. 251—8 **3 Claims**



1. Deflectable Sleeve Type Valve comprising:

(a) a valve housing having a central horizontal bore and a central, enlarged cavity;

(b) a unitary insert having a central access port terminating in at least one radially extending vertical orifice at one side of a partition wall portion and having a second opposite access port located along the same horizontal axis on the opposite side of the partition wall portion and communicating with at least one more vertical port to the exterior of said circular insert, said circular insert having a recessed exterior portion encompassing the areas where the orifice and at least one additional vertical port are located said circular insert being inserted within the horizontal bore while extending along the entire length of said valve housing and abutting a first shoulder means on said valve housing when said circular insert has been fully inserted within said valve housing and providing as slightly extending surface at both ends thereon to provide a fluid seal when the valve housing is attached to as piping system.

(c) a tubular seal extending and surrounding the substantial length of said circular insert and having their outer extremities retained within said cylindrical bore of the valve housing between said circular insert at said first shoulder means and a second shoulder means on the other end of the valve housing;

(d) a plunger slidingly engaged within the radial recess of said housing, the lower surface being in close contact with the outside diameter of said tubular seal;

(e) a mechanical actuating means attached to said valve housing and capable of displacement of said plunger and thereby forcing only the central portion of the tubular seal against said recessed exterior portion in order to open and close only said vertical orifice in the cylindrical insert circular insert to reduce the bending stresses on the tubular seal.

4,953,825

ELECTRO-MAGNETIC PROPORTIONAL FLOW CONTROL VALVE

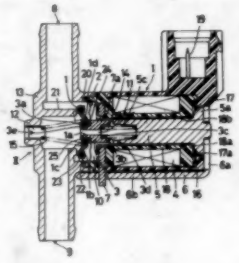
Toru Osumi, Toyota; Shoji Ito, Nagoya, and Kenji Hashimotu, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 30, 1989, Ser. No. 400,766

Claims priority, application Japan, Aug. 30, 1988, 63-112799[U]

Int. Cl.[5] F16K *31/06*

U.S. Cl. 251—129.17 **7 Claims**



1. An electro-magnetic proportional flow control valve, comprising:

an electromagnet solenoid including a bobbin having an axial bore and a fixed core in said axial bore;

a valve housing defining a first port, a second port and a valve seat fluidically positioned between said first and second ports;

a valve normally in a closing position for closing said valve seat and interrupting fluid communication between said first and second ports;

a movable core fixed to said valve and positioned relative to said electro-magnetic solenoid such that said movable core is attracted to said fixed core upon excitation of said electro-magnetic solenoid to fluidically communicate said first and second ports;

an annular diaphragm positioned between said valve and said electro-magnetic solenoid and sealingly mounted to said movable core so as to form a fluid tight pressure chamber on a side of said diaphragm opposite said valve, wherein an outer circumference of said diaphragm is fixed relative to said axial bore of said bobbin, whereby said movable core is held in said axial bore and coaxial thereto by said diaphragm, and wherein said diaphragm comprises a corrugated metal disc having a center hole, said disc having an outer circumference sealingly imbedded in a wall of said bobbin and being sealingly mounted to said movable core via said center hole; and

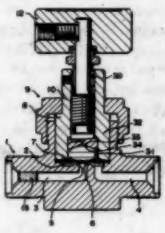
a passage in said movable core for fluidically communicating said pressure chamber with said second port, whereby forces acting on said valve due to pressure differences across said valve are cancelled.

4,953,826

METAL DIAPHRAGM VALVE

Tadahiro Ohmi; Yohichi Kanno; Kazuhiko Satoh, and Tadahiro Hatayama, all of Sendai, Japan, assignors to Motoyama Eng. Works, Ltd., Miyagi, Japan

Filed Aug. 4, 1989, Ser. No. 389,704
Claims priority, application Japan, Aug. 12, 1988, 63-200008
Int. Cl.[5] F16K 7/16
U.S. Cl. 251—331 9 Claims



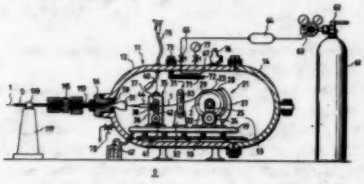
1. A metal diaphragm valve comprising:
a valve cage;
a metallic valve seat integral with the valve cage;
a metal diaphragm having a peripheral edge portion supported in a liquid-tight manner by the valve cage and a central portion facing the valve seat to touch and leave the seat;
a drive means for opening and closing the metal diaphragm; and
diaphragm pressing means formed of resin material, interposed between the drive means and the metal diaphragm, for pressing the diaphragm against the valve seat at a uniform sealing pressure.

4,953,827

METHOD FOR INSERTING THREAD INTO TUBE

Nobuo Araki, Tokyo; Kazufumi Tabata, Narashino; Kiyomi Yokoi, and Ashidate Tadami, both of Tokyo, all of Japan, assignors to Nippon Steel Welding Products & Engineering Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1989, Ser. No. 310,671
Claims priority, application Japan, Aug. 11, 1988, 63-199015; Aug. 15, 1988, 63-201910
Int. Cl.[5] B66F 3/24
U.S. Cl. 254—134.4 17 Claims



1. A method of inserting a thread into a tube which comprises the steps of:
placing a thread in a sealed container;
positioning the leading end of the thread relative to one end of a tube connected to the sealed container where it is ready for insertion into one end of the tube;
supplying a pressurized gas into the sealed container and passing the pressurized gas into the tube from the end thereof, the stream of the pressurized gas carrying the thread from the sealed container forward through the tube, the pressure of the gas in the sealed container being high enough to keep the mean flow rate of the gas at any given point of the tube above the advancing speed of the thread; and
causing the thread to move within the tube so that a portion of the thread is aslant to the center axis of the tube for building up a difference in the static pressure of the gas ahead of and behind the aslant portion for giving a positive longitudinal surging motion to the thread advancing through the tube.

4,953,828

APPARATUS FOR PRACTICING A PNEUMATIC SUCTION PROCESS PERMITTING DRAWING CABLES THROUGH SHEATHS

Sauro S. Baldecchi, 174 Chemin de Gipieres, 06370 Mouans Sartoux, France, and Patrick Bourgin, 264 Chemin du Fort Carré, 06140 Vence, France

Filed May 4, 1989, Ser. No. 347,037
Int. Cl.[5] B66F 3/00
U.S. Cl. 254—134.4 4 Claims

1. Disposable device for drawing conductive cables through a sheath by means of vacuum applied to one end of the sheath, which is of one-piece construction of self-lubricating plastic, comprising a body of rotation in the form of a cap having a flexibly deformable skirt which flares rearwardly outwardly and which ensures pneumatic sealing with the interior of the sheath, an anchor extended axially in one direction from the cap and having an opening therethrough in which the cables can be received, an axle extending forwardly in the other direction from the cap, and an enlargement on the end of the axle remote from the cap, by which enlargement the device can be grasped for manually pulling on the assembly of the device and the conductive cables drawn thereby, the enlargement having an exposed outermost periphery that is rounded.

4,953,829

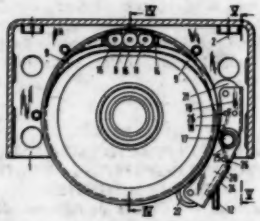
FASTENING A CABLE OR A DRUM

Karl Knaack, Dortmund, and Rainier Horbach, Witten, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 57,957
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618759; Mar. 12, 1987, 3708212
Int. Cl.[5] B66D 1/34, 1/35
U.S. Cl. 254—333 11 Claims

1. A winch including structure for fastening a cable to an end face of a cable drum having a longitudinal axis, the drum having a helical peripheral groove and a recessed groove wall on said end face, the groove wall being perpendicular to the longitudinal axis of the drum, comprising:
a cable end receiving groove in said end face, comprising a straight groove portion and at least one curved groove portion which merges with said peripheral groove for receiving one end of the cable;
at least one axially extending fastening screw means having head means; and
at least one axially extending threaded bore in said groove

wall adjacent said straight groove portion, for receiving the screw means, the axial bore being positioned so that



the head means of the screw means clamps the cable in the straight groove portion and against the recessed groove wall.

4,953,830

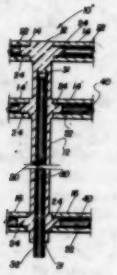
RAILING ASSEMBLY

James R. Weaver, III, Miami, Fla., assignor to Saftron, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 302,634, Jan. 27, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 413,876

Int. Cl.[5] E04H *17/14*

U.S. Cl. 256—65 **14 Claims**



1. A railing assembly formed from a plurality of interconnected components of moldable material, said assembly comprising:

a. a plurality of spaced apart, vertically oriented elongated support stanchions each having a hollow interior extending along the length thereof and including a lower end adapted to be anchored to a support surface,

b. at least one cross brace having opposite ends thereof connected to spaced apart, next adjacent ones of said support stanchions disposed at said opposite ends of said cross brace,

c. each of said plurality of support stanchions including reinforcement means formed thereon for strengthening thereof and comprising an elongated, high strength material reinforcement member secured continuously to each stanchion along the length of said reinforcement member,

d. each of said plurality of stanchions formed by injection molding the length thereof in bonded engagement with an exterior surface of a different one of said reinforcement members to define an integral, unitary construction therewith,

e. each of said stanchions including an anchor means for securing said lower end to the support surface at least partially defined by a tapered lower end portion having a reduced wall thickness of each stanchion at said lower end relative to the thickness of a remainder of a wall of said stanchion,

f. said assembly further comprising a plurality of cross braces, each connected at opposite ends thereof to adjacent ones of said stanchions in transverse relation thereto and each cross brace having a hollow configuration along its length; a plurality of pickets disposed in spaced, parallel relation to one another and to said stanchions and each picket having an opposite end thereof extending into said hollow interior of a correspondingly positioned one of said cross braces, and

g. said assembly including locking means securing said pickets to said cross braces and including an elongated strip of extrudable material disposed on the interior of said cross brace in confronting engagement with interior surface portions thereof, each of said strips comprising at least one free longitudinal edge disposed in locking engagement with correspondingly positioned ends of said plurality of pickets in spaced apart locations along said longitudinal edge.

4,953,831

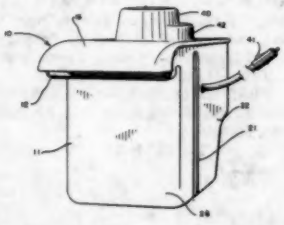
EVAPORATIVE AIR COOLER

Charles W. Albrecht, Evanston, Wyo., assignor to Cool Pet Industries, Inc., Evanston, Wyo.

Filed Jun. 21, 1989, Ser. No. 369,190

Int. Cl.[5] F24F *3/14*

U.S. Cl. 261—102 **18 Claims**



1. An evaporative air cooling device, comprising:

means defining an air flow passage;

air blower means mounted to cause air to flow through the passage;

an evaporation pad having a thickness substantially smaller than at least one of its length and width, said thickness being defined by an upstream surface and an opposing surface of the pad, the pad being installed in a portion of the passage, said portion being shaped and sized to generally conform to the length and width of the pad and to be substantially greater in width than the thickness of the pad in the direction of said thickness, so that an unimpeded flow channel of substantial cross sectional area is provided through said portion of the passage, said channel extending substantially both the length and the width of the pad and being bordered on at least one of its sides the upstream surface of the pad; and

means wetting the pad with water without prior contact of the water with a stream of air to be cooled.

4,953,832

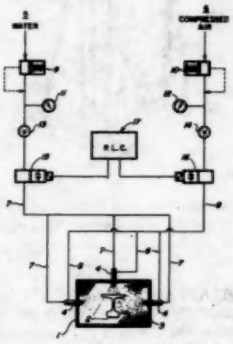
APPARATUS FOR THE CONTROLLED COOLING OF HOT ROLLED STEEL SAMPLES

Gary D. Kotsch, Annville; Philip M. Giles, Jr., Bethlehem, and Raymond H. Biemiller, Harrisburg, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 24, 1988, Ser. No. 173,709

Int. Cl.[5] C21D *1/667*

U.S. Cl. 266—82 3 Claims



1. Apparatus for the controlled cooling of a hot steel sample or samples in preparation for laboratory analysis comprising a closable sample container, a plurality of spray nozzles within said container, conduits connecting said nozzles to a source of cooling water and to a source of compressed air, programmed means to spray predetermined amounts of cooling water and compressed air from said nozzles against said sample for predetermined periods of time.

4,953,833

HYDRAULICALLY DAMPING ELASTIC BEARING

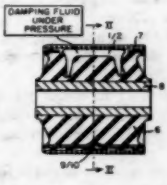
Kurt Schmidt, Heimersheim, and Detlef Waloszyk, Titz-Rödingen, both of Fed. Rep. of Germany, assignors to Boge AG, Fitorf, Fed. Rep. of Germany

Filed Aug. 17, 1989, Ser. No. 395,018

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827905

Int. Cl.[5] F16F *13/00*

U.S. Cl. 267—140.1 13 Claims



1. A hydraulically damping elastic bearing comprising:
an inner tube;
an outer tube disposed about and separated from said inner tube;
an at least one elastic member between said inner tube and said outer tube;
at least one of said inner tube, said outer tube and said at least one elastic member defining at least two chambers within said bearing;
throttle passage means between said at least two chambers;
a damping medium in said at least two chambers and said throttle passages means therebetween at a predetermined elevated pressure above atmospheric pressure;
said damping medium having at least one predetermined vaporization pressure; and
said predetermined elevated pressure being greater than said at least one predetermined vaporization pressure;
said at least two chambers and said throttle passage means being configured to substantially maintain said predetermined elevated pressure of said damping medium, such that, said at least two chambers, said throttle passage means, and said damping medium comprising means for minimizing formation of at least one of:
gas bubbles and cavitation
of said damping medium during use of said elastic bearing.

4,953,834

PENDULUM WITH BENDING SPRING JOINT

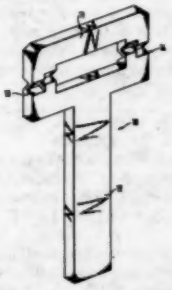
Wolfram Ebert, Freiburg; Eberhard Handrich, Kirchzarten; Martin Hafen, Rottweil, and Bruno Ryrko, Denzlingen, all of Fed. Rep. of Germany, assignors to Litef GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,295

Claims priority, application European Pat. Off., Jan. 20, 1987, 87100744.9

Int. Cl.[5] F16F *1/18*

U.S. Cl. 267—160 4 Claims



1. A pendulum device comprising in combination:
(a) a generally T-shaped pendulum;
(b) a pendulum fastening device;
(c) said pendulum and said pendulum fastening device being formed from a wafer;
(d) said pendulum being joined to said pendulum fastening device by means of two homologous micromechanical bending spring joints comprising a pair of leaf springs arranged alongside each other and at oblique angles with respect to the major surfaces of said wafer; and
(e) said pendulum device being selectively etched from a single wafer.

4,953,835

WIRE FOR COILED SPRING

Yukio Matsumoto; Horiyuki Saito, and Kuniki Morita, all of Utsunomiya, Japan, assignors to Murata Hatsujo Co. Ltd., Tochigi, Japan

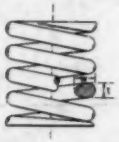
Continuation of Ser. No. 177,269, Apr. 4, 1988, abandoned, which is a division of Ser. No. 9,041, Jan. 28, 1987, Pat. No. 4,735,903, which is a continuation of Ser. No. 638,602, Aug. 7, 1984, abandoned. This application Jul. 12, 1989, Ser. No. 378,678

Claims priority, application Japan, Dec. 1, 1983, 58-225484

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[5] F16F *1/06*

U.S. Cl. 267—180 **2 Claims**



1. A spring wire, intended for use in making a coiled spring, in which a cross sectional shape of said wire has a surface that is semicircular at the outside of the coiled spring made therefrom and substantially semielliptical at the inside of said coiled spring, said wire having a sectional shape over the entire substantially semielliptical surface defined by a semielliptical portion and a straight line portion connecting said semielliptical portion and said semicircular surface, wherein the length (L) measured on a coordinate from the center of the semicircular surface (O) to the substantially semielliptical surface is greater than the corresponding dimension (L_o), taken on the same coordinate, of an ellipse expressed by $a/b=(2w)/t-1$, where a is a long diameter and b the short diameter of the ellipse, t is the maximum dimension of said wire along a longitudinal axis of the coiled spring formed of said wire, and W is the maximum dimension of said wire at a right angle to said axis, such that the surface distribution of stress in coils of the spring made from said wire, when plotted at various angles (psi) taken about the center of gravity (G) of said wire, is made essentially uniform along a substantial portion of said plot, whereby low maximum surface stress is achieved for given dimensions t and W of said wire.

4,953,836

WORK HOLDER APPARATUS

Mark Starck, 1228 Fourth St., Berthoud, Colo. 80513

Filed Mar. 20, 1989, Ser. No. 326,082

Int. Cl.[5] B23Q *1/04*

U.S. Cl. 269—17 **11 Claims**

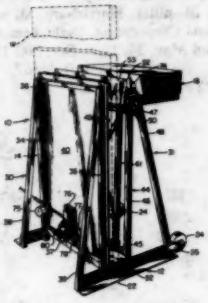
1. Work holder apparatus for handling large workpieces, such as, doors, countertops and panels comprising:

a base support member;

a pair of spaced upright frame members disposed on said base support unit and extending upwardly from said unit with a common channel therebetween for insertion and positioning of a workpiece in said channel;

a movable clamping member including means pivotally mounting said clamping member adjacent to an upper end of one of said frame members for movement toward and away from the other of said frame members, and a workpiece-engaging surface on said clamping member in facing relation to said other of said frame members; and

clamp control means for horizontally advancing said clamping member toward and away from said other of said frame members whereby to rigidly clamp said workpiece in said channel, said clamp control means including fluid-actuated cylinder means engageable with said clamping member, and means for actuating said cylinder means to



cause pivotal movement of said clamping member toward and away from the workpiece in said channel.

4,953,837

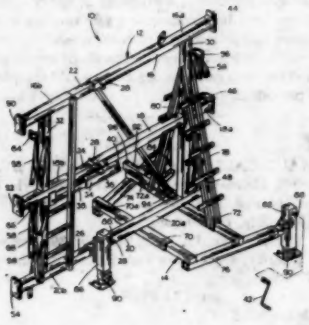
METHOD AND APPARATUS FOR INSTALLATION AND ALIGNMENT OF A SERIES OF POSTS

D. William Giroux, 694 Umpqua Pl., LaConner, Wash. 98257

Filed Mar. 17, 1989, Ser. No. 324,608

Int. Cl.[5] B25B *1/20*

U.S. Cl. 269—43 **8 Claims**



1. An apparatus for locating and aligning a post with respect to another post, comprising:

a frame means having an upper and lower elongated generally horizontal member, each horizontal member having first and second ends;

a first vertical member mounted between said upper and lower members adjacent said first ends, to maintain said first ends in vertically-aligned and spaced-apart relationship;

a second vertical member mounted between said upper and lower members adjacent said second ends to maintain said second ends in vertically-aligned and spaced-apart relationship;

foot members connected to said frame means for supporting said frame means in the desired alignment above the ground;

first operable attachment means for selectively, removably attaching a first post to said first ends of said frame; and

second operable attachment means for selectively, removably attaching a second post to said second ends of said frame;

said upper and lower horizontal members and first and sec-

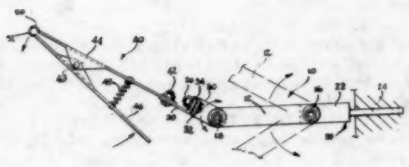
ond vertical members being connected such that said second post will be positioned at a predetermined distance from said first post in a substantially vertically disposed position parallel to said first post, such that a rectangular panel may be installed between said first and second posts.

4,953,838

WORK POSITIONING DEVICE

Michael X. Peters, 13967 Marquesas Way, No. 46, Marina Del Ray, Calif. 90292

Filed Sep. 5, 1989, Ser. No. 402,235
Int. Cl.[5] B25B *1/22*
U.S. Cl. 269—45 **15 Claims**



1. A work positioning device for positioning a work piece with respect to a tool in an essentially unlimited number of positions, said work positioning device comprising:

(a) a frame;

(b) a mounting arm pivotally connected to one end of said frame enabling said frame to be rotatable about a first axis, said mounting arm being adapted for securement to a fixed structure;

(c) a first positioning arm pivotally connected to another end of said frame and being rotatable about a second axis with respect to said frame, said second axis being generally parallel in space to said first axis so that the first positioning arm moves in a plane generally parallel to said mounting arm;

(d) a second positioning arm pivotally connected to said first positioning arm and being rotatable about a third axis which is generally perpendicular in space to said second axis;

(e) a work holding arm pivotally connected to said second positioning arm and being rotatable with respect thereto about a fourth axis, said work holding arm being capable of being moved to an essentially unlimited number of positions through said four axes with respect to a tool;

(f) means associated with said mounting arm to permit said mounting arm to be pivotally connected to a fixed structure about a fifth axis; and

(g) means associated with said work holding arm to releasably secure a work piece thereto.

4,953,839

VISE

Sen-Kuen Chern, No. 660, Hsing-HO Rd., Sha-Lu Town, Taichung Hsing, Taiwan

Filed Sep. 28, 1989, Ser. No. 414,171
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—73 **11 Claims**

1. A vise comprising:

a base having two side walls and a base line for an aligning purpose;

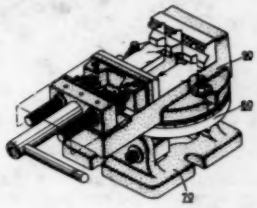
an elongate body having a first end, a second opposite end having an intermediate hole and side holes, a middlely longitudinal through groove, and two end side plates one of which is provided with an angular scale capable of being utilized together with said base line to indicate an angle included by said base and said elongate body;

a connecting rod pivotally connecting together said base and said elongate body and capable of allowing said side walls to fixedly clamp therebetween said side plates;

a movable seat having a lower engaging piece which includes two side extensions and is capable of being slidably guided in said groove;

two following gears rotatably, untranslatably and horizontally spacedly attached to said second end;

two guiding screw rods respectively passing through two side holes, screwedly rotatably and respectively coaxially mounted in said following gears and respectively having one ends thereof capable of horizontally spacedly urging against said movable seat;



a shaft rotatably mounted in said second end and passing through said intermediate hole;

an active gear mounted on said shaft and meshed between said following gears;

a driving handle connected to said shaft;

a first jaw member attached to said first end;

a second jaw member attached to said movable seat;

a reinforcing locking member having a threaded hole; and

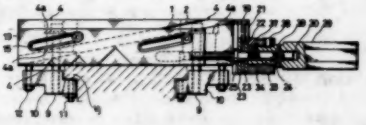
a bolt passing through one of said side walls to be threaded into said threaded hole and capable of being rotated to assistantly tightly urge one of said side plates against said one side wall.

4,953,840

VICE JIG

Akira Nishimura, Kanazawa, Japan, assignor to Kabushiki Kaisha Nishimura Jig, Kanazawa, Japan

Filed Sep. 8, 1989, Ser. No. 404,570
Int. Cl.[5] B23Q *1/04*
U.S. Cl. 269—282 **11 Claims**



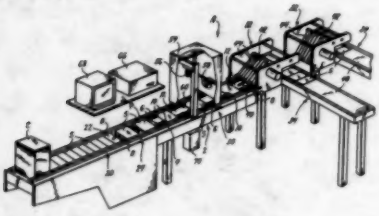
1. A work holding vice jig to be removably attached to a jaw of a vice, wherein said jig comprises a body and a pair of fixing pieces, said body having a pair of parallel through holes and also having one side face thereof parallel to said through holes which one side face serves as a work holding face having grooves for holding works of special shapes, said fixing pieces being threadedly engaged with the tip ends of bolts inserted through said through holes; wherein an inclined guide slot is formed in a side face opposite to the side face serving as the work holding face of said body; a slide member having a rib adapted to be fitted in said guide slot and also having a horizontal work resting surface is provided; a pair of threaded holes are formed in the vicinity of said guide slot; and elongated through holes for the mounting of bolts are formed in said slide member in positions corresponding to said threaded holes.

4,953,841

MACHINE AND PROCESS FOR SEPARATING SIGNATURES

Kenneth J. Polarek, Effingham, Ill., assignor to World Color Press, Inc., Effingham, Ill.

Filed Oct. 7, 1988, Ser. No. 254,581
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—58 **18 Claims**



1. An apparatus for separating like book signatures from a mixture of book signatures, said apparatus comprising: means for moving the signatures one after the other along a path in a predetermined orientation in the path; a camera located along the path such that the signatures as they are advanced by the conveying means come successively within the field of view for the camera; diverting means located along the path for directing signatures to selected locations upon command, with each location being separate from the other locations and being reserved for like signatures; and computing means connected with the camera and to the diverting means for

a. storing within a memory an image of a limited area of interest from each of several signatures that are to be separated into groups of like signatures and the locations of those limited areas within the signatures,

b. through the camera capturing images from signatures that come within the field of view for the camera,

c. comparing the stored images one after the other with each successive captures image, with each comparison being between the limited area of interest for the stored image and an area of similar location in the captured image so as to identify those captured images which correspond with stored images both as to content and location, with the comparison being two dimensional in character, and

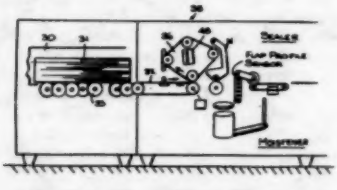
d. as to each identified captured image, commanding the diverting means to direct the signature having that image to the location reserved for signatures having that image, whereby like signatures are isolated at separate locations.

4,953,842

MAIL THICKNESS MEASURING APPARATUS

Robert J. Tolmie, Jr., Brookfield, and Donald T. Dolan, Ridgefield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,038
Int. Cl.[5] B65H *3/04*
U.S. Cl. 271—2 **7 Claims**



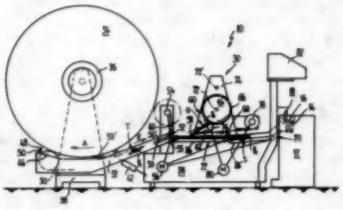
1. Apparatus for measuring the thickness of mail pieces, comprising means for generating a magnetic field pattern, an array of magnetic field detectors for outputting a binary signal in response to the field pattern, said field generating means and detectors being configured such that the outputted binary signal is absolute and Gray encoded over a range of thicknesses of the mail, means for contacting the mail and movable in response to the thickness of the contacted mail, and means connecting the contacting means and generating means for moving the latter past the array over the distance proportional to the movement of the contacting means, the field generating means being a magnet having plural poles arranged in a row a first pole segment, a second pole segment, and a third pole segment of the same type as the first pole, the three segments having differing lengths, the magnetic field detectors being equally spaced apart.

4,953,843

METHOD OF, AND APPARATUS FOR, LOADING A SINGLING INSTALLATION FOR PRINTED PRODUCTS

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Jul. 21, 1988, Ser. No. 223,958
Claims priority, application Switzerland, Jul. 24, 1987, 02821/87
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—3.1 **22 Claims**



1. A method of loading a processing apparatus for printed products, and comprising the steps of

forming an arriving imbricated stream of printed products,

singling the printed products of the arriving stream,

forming the singled printed products into an imbricated buffer stack leading to the processing apparatus and including reducing the imbrication pitch of the products,

selectively removing some of the singled printed products to a buffer package and winding the products thereupon,

unwinding the printed products from the buffer package upon an interruption of the arriving imbricated stream, and

delivering the unwound printed products in imbricated formation to said imbricated buffer stack.

4,953,844

PAPER SUPPLY DEVICE WITH A FUNCTION OF AUTOMATICALLY SENSING THE LIFE OF FEED ROLLERS

Yasuhiro Iwata, and Yuzi Uchigasaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1989, Ser. No. 314,036
Claims priority, application Japan, Mar. 2, 1988, 63-47403
Int. Cl.[5] B65H *5/06*
U.S. Cl. 271—9 **16 Claims**

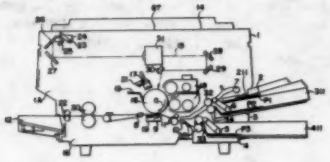
1. A paper supply device comprising:

first roller means arranged in at least two feed paths for alternative use when a copying operation is performed;

second roller means for sequentially and downstream feeding sheets of copying paper supplied from said first roller means; and

detecting means for detecting the frequency of use of said

second roller means from the rotational frequency of said second roller means corresponding to a sum of the rotational frequency of said first roller means in the feed paths, rotated by feeding said sheets of copying paper.



4,953,845

DEVICE FOR HANDLING AND GUIDING BUNDLES WITH VERTICAL SHEET STACKERS

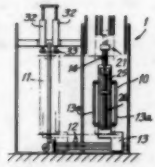
Antonio Castiglioni, Varallo Pombia, Italy, assignor to Civiemme S.r.l., Italy

Filed Nov. 8, 1988, Ser. No. 268,740

Claims priority, application Italy, Nov. 20, 1987, 22720 A/87

Int. Cl.[5] B65H *31/00*

U.S. Cl. 271—217 **7 Claims**



1. An arrangement for handling and guiding a bundle of sheets in and between stacking and binding stations in which the sheets are stacked and bound, respectively, comprising:

(a) means for pressing the sheets in the bundle in the stacking station to form a pressed bundle, said pressing means including an arm mounted for displacement between a pressing position in which the arm engages an uppermost sheet in the bundle, and a removed position in which the arm is disengaged from the uppermost sheet;

(b) means for moving the pressed bundle along a stacking path through the stacking station with the arm in the pressing position;

(c) said pressing means includes means for moving the arm in a direction generally parallel to the stacking path;

(d) said pressing means being mounted on a support that, in turn, is guidably mounted for movement in a direction generally parallel to the stacking path;

(e) means for conveying the pressed bundle from the stacking station along a transfer path to the binding station with the arm in the pressing position;

(f) means for displacing the arm to the removed position to form a released bundle in the binding station; and

(g) means for compressing the released bundle with the arm in the removed position prior to binding in the binding station.

4,953,846

APPARATUS FOR CONVEYING A SHEET OBLIQUELY

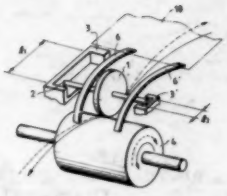
Takahiro Azeta, Kawasaki; Toru Kameyama, Tokyo; Harukazu Sekiya, Yokohama; Toshifumi Moritani, Yokohama; Akira Higeta, Yokohama; Kenji Baba, Kofu; Takeshi Matoba, Yokohama; Shinji Goto, Tokyo, and Kazuyuki Kubota, Yamanashi, all of Japan, assignors to Canon Kabushiki Kaisha and Nippon Seimitsu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 17, 1988, Ser. No. 233,485

Claims priority, application Japan, Aug. 19, 1987, 62-206648; Aug. 19, 1987, 62-126686[U]

Int. Cl.[5] B65H *9/16*

U.S. Cl. 271—251 **10 Claims**



1. A sheet obliquely conveying apparatus comprising:

a pair of sheet conveying means having a forwardly and reversely rotatable drive roller and a follower roller rotatable in contact with said drive roller, said follower roller being mounted on a shaft;

bearing means for rotatably supporting the shaft of said follower roller, the dimension of a first bearing portion of said bearing means which supports one end of the shaft of said follower roller being greater generally along a direction of conveyance of a sheet material than the dimension of a second bearing portion of said bearing means which supports the other end of said shaft; and

resilient means generally parallel to the direction of conveyance of the sheet material for pressing the shaft of said follower roller, said resilient means comprising an elongated member elongated in the conveyance direction and pressing the shaft of the follower roller such that the shaft of the follower roller rolls on a surface of the elongated member.

4,953,847

METHOD OF AND APPARATUS FOR OUTFEEDING PRINTED PRODUCTS ARRIVING IN AN IMBRICATED FORMATION

Werner Honegger, Tann-Ruti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Feb. 27, 1989, Ser. No. 316,339

Claims priority, application Switzerland, Mar. 3, 1988, 00809/88

Int. Cl.[5] B65H *5/08*

U.S. Cl. 271—277 **16 Claims**

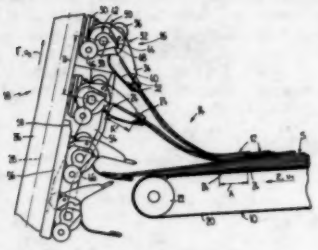
1. A method of outfeeding printed products, particularly multi-sheet and preferably folded printed products, comprising the steps of:

infeeding in an imbricated formation the printed products arranged in tandem and at a predetermined spacing and imbricatingly overlapping one another;

engaging each time at least two printed products in region of leading edges thereof by means of grippers of an outfeed device;

said step of engaging each time at least two printed products entailing the engagement of at least two printed products by a single gripper while maintaining the predetermined spacing which said at least two printed products occupy in said infed imbricated formation;

retaining said at least two printed products having the predetermined spacing; and



outfeeding said at least two printed products having the predetermined spacing.

4,953,848

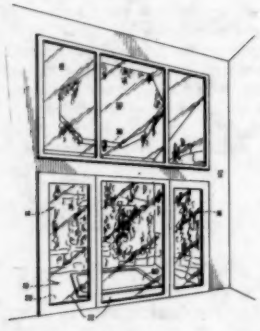
INDOOR STRUCTURE THAT SIMULATES AN OUTDOOR ENVIRONMENT

Michael Braunstein, 2500 Stonehaven Ct. South, Columbus, Ohio 43220, and Richard Huggins, Columbus, Ohio, assignors to Michael Braunstein, Columbus, Ohio

Filed Sep. 19, 1989, Ser. No. 409,060

Int. Cl.[5] A63G *1/00*

U.S. Cl. 272—8.5 **100 Claims**



1. An indoor structure that simulates an outdoor environment, said structure comprising:

(a) a front wall having at least one transparent window therein, said front wall having a first side and a second side;

(b) a ceiling which slants from a high end at or adjacent said second side of said front wall to a low end removed from said front wall, said ceiling having an inside surface facing said wall and an outside surface facing away from said wall;

(c) an aperture in said ceiling, said aperture having a periphery;

(d) a concave dome located on the outside of said ceiling over said aperture, said concave dome having a light reflecting inside surface facing said ceiling and an outside surface facing away from said ceiling;

(e) first means for shining light on said light reflecting inside surface of said concave dome; and

(f) second means for concealing said first means from a viewer located on said first side of said front wall.

4,953,849

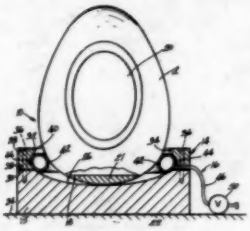
RIDING CAPSULE DEVICE WITH CONTROL MECHANISM

Victoria K. Reed, 1778 Peck La., Cheshire, Conn. 06410

Continuation-in-part of Ser. No. 922,942, Oct. 24, 1986. This application Nov. 17, 1989, Ser. No. 437,746

Int. Cl.[5] G65G *1/00*

U.S. Cl. 272—35 **6 Claims**



1. A riding capsule device including a capsule member, a base, and control mechanism, said capsule member having a bottom configuration in the form of a convex spherical segment, said base having a lower portion with a top configuration in the form of a concave spherical segment engaged by said bottom configuration of said capsule member and having a radius of curvature which is larger than the radius of curvature of said bottom configuration of said capsule member, said base further having an upper portion with an internal concavely arcuate surface that forms a smooth continuation of and overlies said concave spherical segment of said bottom portion of said base said control mechanism including a circular, tubular control member that is inflatable and deflatable and which when inflated is doughnut shaped, and which is attached to said concavely arcuate surface of said upper portion, and which, when inflated engages and immobilizes said capsule member, and which, when deflated, goes limp and disengages said capsule member.

4,953,850

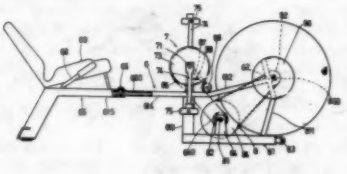
WIND-DRAG TYPE EXERCISE BICYCLE WITH PEDALS DISPOSED IN FRONT OF THE SEAT THEREOF

Peter K. Lo, P.O. Box 13-124, Taipei, Taiwan

Filed Sep. 27, 1989, Ser. No. 413,119

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—73 **2 Claims**



1. An exercise bicycle comprising:

a frame assembly adapted to rest on a horizontal surface;

a seat with a back fixed on a rear end portion of said frame assembly for positioning of a user thereon;

two handlebars fixed on said frame assembly at two sides of said seat so that the user can grip thereon;

a drive assembly including a driving shaft journalled on a middle portion of said frame assembly, a driving sprocket sleeved rigidly on said driving shaft, two crank arms respectively secured to two ends of said driving shaft, a...

two pedals respectively secured to said crank arms so that the user's feet can step thereon;

means for adjusting the distance between said seat and said drive assembly;

a wheel assembly including a wheel axle journalled on a front end portion of said frame assembly, a hub sleeved rigidly on said wheel axle, a wheel body sleeved rigidly on said hub, and a driven pulley sleeved rigidly on said hub, said wheel body having a plurality of generally radially extending wheel blades;

a driven shaft assembly including a driven shaft journalled on said frame assembly between said drive assembly and said wheel assembly, a driven sprocket sleeved rotatably on said driven shaft, a chain trained on said driving sprocket of said drive assembly and said driven sprocket of said driven shaft assembly, a freewheel clutch interposed between said driven sprocket and said driven shaft so as to lock said driven sprocket on said driven shaft when said pedals are rotated in one direction, a driving pulley sleeved rigidly on said driven shaft, and a V-belt trained on said driving pulley of said driven shaft assembly and said driven pulley of said wheel assembly; and

a tensioning device connected to said chain so as to tension said chain;

whereby, rotation of said pedals can be transmitted to said driven shaft and subsequently to said wheel body.

4,953,851

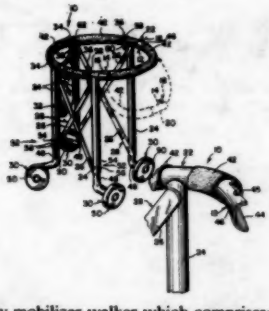
SAFETY MOBILIZER WALKER

Lila A. Sherlock, 280 Collins Ave., Mt. Vernon, N.Y. 10552, and Maryann P. Finn, 246-31 137th Rd., Rosedale, N.Y. 11442

Filed Nov. 7, 1988, Ser. No. 268,035

Int. Cl.[5] A61H *3/00*

U.S. Cl. 272—70.3 **6 Claims**



1. A safety mobilizer walker which comprises:

(a) a generally circular shaped rim member having a stationary portion and allowing user to grip said generally circular shaped rim member during an atoxia attack, a vertigo attack, or fatigue until help arrives;

(b) a curved arm member hinged at one end to said generally circular rim member;

(c) means for securing said arm member at its free end in a closed position to said generally circular rim member and forming an "O"-shaped configuration, said arm member securing means including a rivet pin carried on top of said free end of said curved arm member and said generally circular rim member having a cutout area with topnotch in distal end thereof to receive said rivet pin when free end of said curved arm member swings into said cutout area in said distal end of said generally circular rim member, said cut out area contained in said free end of said fixed member to assist in connecting said free end of said fixed member with said free end of said curved arm member while said fixed end remains pivotable in a plane defined by said generally circular rim member, since said generally circular rim member and said curved arm member are substantially curved and only said curved arm member is disposed pivotally in the same plane as said generally circular rim member the connection can only be achieved by pivotable means so that said free end of said curved arm member swings into said free end of said generally circular rim member;

(d) four vertical support legs spaced about and affixed to said stationary portion of said generally circular rim member;

(e) four brace members affixed diagonally between said support legs to form two X-shaped frames for stabilizing and for preventing torsional deformation and shear stress of said support legs;

(f) four wheel assemblies, each mounted to bottom of each of said support legs and having adjustment means to adjust height of said generally circular rim member without having to remove any members so that a disabled person can enter said generally circular rim member, close said arm member and be supported therein when moving about;

(g) a non-rigid sling seat having a second side and a first side, said first side being disposed on and removably suspended from said generally circular shaped rim member, said sling being readily adjustable while being removably attached at said first end and said second end to said generally circular shaped rim member so that said sling is readily removed for cleaning incontinence accidents, in addition to the normal cleaning, and repairing;

(h) means for removably suspending said sling seat from said second side said sling seat being disposed on said generally circular shaped rim member and said sling seat being in an open position so that the disabled person can sit within said sling seat which is in said opened position and be supported therein when moving about; and

(i) means for suspending said sling seat in a folded position onto itself so that the disabled person can stand within said walker and be supported therein when moving about.

4,953,852

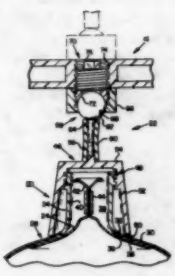
PUNCHING BAG AND SUPPORT

Patrick T. Donohue, 1822 NE. 143rd, Portland, Oreg. 97230

Filed Apr. 26, 1988, Ser. No. 186,453

Int. Cl.[5] A63B *69/00*

U.S. Cl. 272—78 **22 Claims**



1. A punching bag assembly comprising:

a first bag, inflatable and having a wall of a first elastic material and an inflation orifice;

a second bag having a wall of a second elastic material and an opening in the wall, said first and second materials having substantially similar material properties, the first bag being contained within the second bag with the inflation orifice in register with the opening and inflated so that it exerts pressure outwards and distends the second bag, the elasticity of the materials helping to establish a tension in the walls of both bags so that said walls substantially unite to define a single resilient envelope; and

suspension means having a collar including an orifice and

disposed in the opening of the second bag so as to be captured by the bags upon inflation of the first bag and retained between said walls by the tension established in the respective walls so that the opening of the second bag is distended elastically over the collar and the suspension means is substantially integrated with the walls and the first bag inflation orifice is accessible through the collar orifice.

4,953,853

SKI EXERCISING APPARATUS

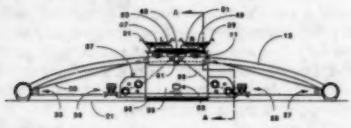
R. Joel Loane, 535 Placitas Ave., Atherton, Calif. 94025

Continuation-in-part of Ser. No. 80,755, Jul. 30, 1987, Pat. No. 4,743,014. This application Apr. 6, 1988, Ser. No. 178,354

The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.

Int. Cl.[5] A63B *69/00*

U.S. Cl. 272—97 **9 Claims**



1. A device for exercising comprising:

at least two rails positioned in a spaced apart parallel relationship;

brace means for holding said rails in said spaced apart relationship, said brace means comprising a first brace element at one end of said rails, a second brace element at the other end of said rails, and a third brace element attached to said rails between said first brace element and said second brace element;

carriage means for providing a stable riding area for riding along said rails;

first resilient means for providing a restoring force on said carriage means toward the middle of said rails, said first resilient means attached at substantially its midpoint to said carriage means, one end of said first resilient means passing around a first roller means at said first brace element and attaching to said third brace element, the other end of said first resilient means passing around a second roller means at said second brace element and attaching to said third brace element;

second resilient means for providing a second restoring force on said carriage means toward the middle of said rails; and

adjustment means for adjusting the magnitude of said second restoring force, said adjustment means contacting said second resilient means at least three point, with a first one of said three points located in a vertical plane on one side of the middle of said rails, with a second one of said three points located in a vertical plane on the other side of the middle of said rails, and with a third one of said three points associated with said carriage means and moving therewith.

4,953,854

STRING EXERCISER

Stephen J. Pizur, Sr., 905 Oak Ave., Barnesboro, Pa. 15714

Filed Aug. 22, 1989, Ser. No. 396,650

Int. Cl.[5] A63B *21/22*; A63H *1/32*

U.S. Cl. 272—93 **4 Claims**

1. An exerciser comprising a flexible, elongated tension member structure incorporating a pair of axially spaced multi-strand tension member end sections, said end sections including pairs of adjacent and remote ends and handle means supported from said remote ends against twisting relative thereto, said tension member structure including a circular cross section central spinner body mounted between said adjacent ends and against spinning relative thereto about the longitudinal extent of said tension member structure, said adjacent ends being independently anchored relative to central portions of the remote sides of said spinner body facing toward the corresponding end section remote ends, said adjacent ends of said tension member end sections being twistable, in opposite directions, about he longitudinal extent of said tension member structure, relative to said remote ends of said tension member structure end sections and said handle means supported therefrom, said handle means comprising elongated handle members adapted to be gripped in and enclosed within clenched hands of a user, the longitudinal mid-length portions of said handle members including eye portions outstanding therefrom disposed in planes each normal to the longitudinal extent of the

corresponding handle member and to which said remote ends are anchored, each of said end sections including a single elongated multi-strand tension member section having a longitudinal mid-portion thereof passed through the corresponding eye portion and its opposite ends anchored to the central portion of the corresponding side of said remote sides of said spinner body, said spinner body being hollow, each of said remote side central portions including a pair of apertures formed therein, said opposite ends of said tension member sections being slidingly received through the corresponding apertures an secured together within the interior of said spinner body, at least one of said remote sides including an access port therein spaced radially outwardly of the corresponding central portion through which each pair of said secured together opposite ends of said tension member sections may be withdrawn.

4,953,855

METHOD AND APPARATUS FOR VARIABLE PROPORTIONAL WEIGHT LIFTING EXERCISES

William D. Shields, 3031 Dalehurst Dr. West, Jacksonville, Fla. 32211

Filed May 18, 1989, Ser. No. 353,784

Int. Cl.[5] A63B *21/062*

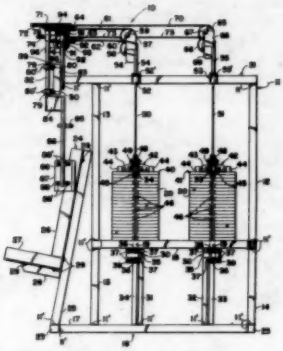
U.S. Cl. 272—118 **64 Claims**

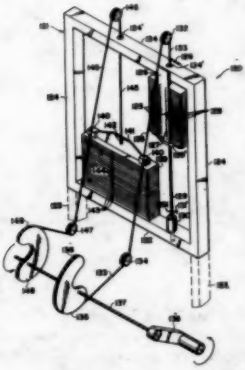
1. A method of changing the weight loading on an exercise element when the element is being operated during an exercise motion by an exerciser comprising the steps of:

A. mounting a cam means having a plurality of separate phases each having lift to be movable in response to the exercise element;

B. providing a stack of weights for each phase of the cam; and

C. moving each stack of weights independently in response to movement of the respective separative phase of the cam





means providing predetermined velocities of movement of respective weight stacks during the exercise motion.

4,953,856

EXERCISE GARMENT

Charles E. Fox, III, 115 Ashford Pl., Greenwood, S.C. 29646

Filed Mar. 17, 1989, Ser. No. 324,729

Int. Cl.[5] A63B *21/065*

U.S. Cl. 272—119 **4 Claims**

1. An exercise garment comprising:

an elastomeric waistband;

a pair of upper leg straps for placement about the thigh; said upper leg straps being attached to said waistband;

removeably secured weights on the front portion of said upper leg straps positioned on the front of a runner wearing said suit;

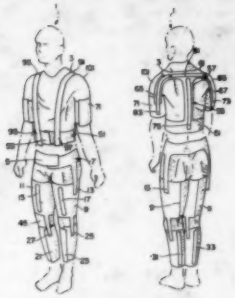
a pair of lower leg straps suspended from said upper leg straps said lower leg straps having a position for removeably securing weights to the back leg portion of a runner;

an upper waist strap to encircle the waist of a runner;

a generally T-shaped member extending from said upper waist strap up the spinal area of the runner to the shoulder portion and extending in a T-like fashion from the shoulders down the backs of the arm to the elbow;

said generally T-shaped member having a weight removeably secured to leg of the "T" extending generally up the spinal portion of the user;

weights removeably secured to the cap portion of the "T" extending to the elbows of the user; and



suspender shoulder straps extending from the upper portion of the "T" back to the waistband to maintain weights in proper position.

4,953,857

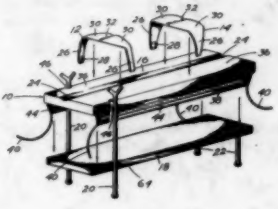
ORTHOPEDIC BACK SUPPORT ATTACHMENT FOR A WEIGHT LIFTER'S BENCH

Brett J. Lemire, 5605 Laguna Dr., Sacramento, Calif. 95758

Filed Jul. 27, 1989, Ser. No. 385,380

Int. Cl.[5] A63B *21/072*

U.S. Cl. 272—123 **5 Claims**



1. An orthopedic back support attachment for a weight lifting bench comprising:

a substantially rectangular, longitudinally elongated padded mat, said padded mat having a use surface side and an oppositely disposed attachment surface side, and said padded mat having a groove providing a narrow channel centrally longitudinally aligned in said use surface side;

a pair of belts for removably attaching said padded mat to a support structure, each said belt having one end attached to the longer sides of said padded mat, the free ends of said pair of belts having fasteners being adjustably attachable to each other for releasably attaching said padded mat to the support structure; and,

means on said padded mat for removably affixing attachments to said padded mat.

4,953,858

SLOPING ROTATABLE EXERCISER

Joseph M. Zelli, Houston, Tex., assignor to Michael P. Breston, Houston, Tex., a part interest

Filed Nov. 10, 1986, Ser. No. 928,552

Int. Cl.[5] A63B *21/04*

U.S. Cl. 272—146 **19 Claims**

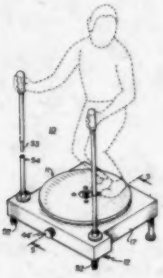
1. An exerciser to simulate the motions and conditions inci-

dent to making turns on a ski slope, and for perfecting body movements that are important for the safety of skiers on a snow-covered slope during a downhill run, and to condition and prepare skiers to carry out swaying movements, one-footed skiing, and other movements of the type normally expected from a downhill skier while making turns, comprising:

a platform for supporting a person;

support means including a frame;

a shaft fixedly mounted on said frame;



bearing means mounted on and supported by said shaft, and said bearing means and said shaft supporting the entire weight of said platform for substantially frictionless rotation in accordance with shift of weight and movements of the person; and

elastic rotation restraining means coupled between said platform and said frame, said restraining means being effective to yieldably resist with increasing force the increasing tendency of the platform to rotate clockwise or counter-clockwise from a neutral start position relative to the frame.

4,953,859

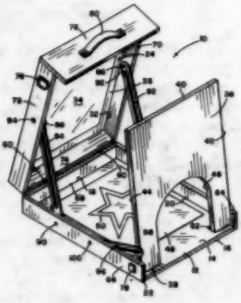
GAME DEVICE

Allen D. West, Drawer 310, Catoosa, Okla. 74015

Filed Oct. 2, 1989, Ser. No. 415,659

Int. Cl.[5] A63F *9/06*

U.S. Cl. 273—1 GA **4 Claims**



1. A game device comprising:

a horizontal base having a top flat surface dimensioned to receive a drawing sheet thereon and having a front edge and a rear edge;

a back board extending upwardly from adjacent said base rear edge and having a forward surface;

a mirror supported to said back board forward surface;

a front board having a top edge and a bottom edge, the bottom edge being secured to said base adjacent said front edge thereof and extending uprightly therefrom, the front board having an opening in the lower portion thereof communicating with said lower edge, the opening being dimensioned to loosely receive the hand and forearm of a user therethrough;

a drawing sheet supported on said base top surface, said opening in the lower portion of said front board providing means for the user to extend his/her hand therethrough whereby the user can peer over said top edge of said front board into said mirror to view a reflection of said drawing sheet and whereby the user may view a drawing made by him/her on said drawing sheet as reflected in said mirror, the top portion of said front board occluding the user's direct view of said drawing sheet.

4,953,860

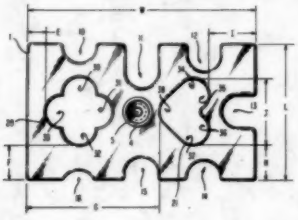
POOL CUE BRIDGE

Marc L. Ames, 539 Lyme Rock Rd., Bridgewater, N.J. 08807

Filed Mar. 3, 1989, Ser. No. 318,740

Int. Cl.[5] A63B *71/00*

U.S. Cl. 273—23 **7 Claims**



1. An improved pool cue bridge which is comprised of a rectangular shaped bridge having width and length sides containing seven cue support positions, three of which being disposed along each long side of said rectangular bridge, said bridge further containing at least one opening within the perimeter thereof, said opening being generally heart shaped and having at least one cue support position.

4,953,861

BALL HITTING SPORTS TOOL

Motoyasu Nakanishi, Fujishi, Japan, assignor to Kabushiki Kaisha Sigel, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,130

Claims priority, application Japan, Mar. 2, 1987, 62-30114; Mar. 30, 1987, 62-47049

Int. Cl.[5] A63B *59/00, 53/00*

U.S. Cl. 273—73 J **4 Claims**

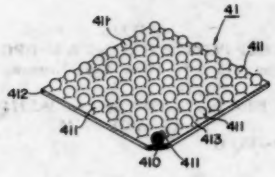
1. A ball hitting sports tool comprising

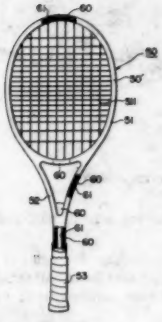
a ball hitting part for hitting a ball,

a stem attached to said ball hitting part, and

a grip attached to said stem and held by a player, said grip having a buffer part, said buffer part having at least one buffer layer which is positioned so that a shock from said ball hitting part is conducted to the position where said buffer part is located, said buffer layer being a gel material filled sheet filled with a gel material with a penetration

value of approximately 50 to 200 according to Japanese Industrial Standard K2530 and having substantially non-





elastic deformation and substantially no repulsive elasticity in response to a shock wave.

4,953,862

HAND GRIP FOR SPORTING EQUIPMENT OR TOOLS

Alan K. Uke, 5980 Rancho Diegueno, P.O. Box 8531, Rancho Santa Fe, Calif. 92067, and Lawrence P. Monty, 54 Briar Rd., Leominster, Mass. 01453

Filed Apr. 18, 1989, Ser. No. 339,689

Int. Cl.[5] A63B *49/08, 59/06, 53/14;* B25G *1/01*

U.S. Cl. 273—75 **10 Claims**

1. A hand grip for a handle shaft, comprising:

an elongated sleeve of elastomeric material having an inner surface for fitting over the outer surface of a handle shaft and an outer, gripping surface;

at least one surface of the sleeve having a plurality of indentations, comprising holes, extending over at least part of its area to allow deflection of the surface in that area under normal impact loads;

the inner and outer surfaces being of octagonal cross-section, including upper and lower flats, and side flats separated from the upper and lower flats by diagonal flats, the indentations being provided at least on the upper and lower flats; and

the outer gripping surface having indentations comprising a plurality of holes extending along the upper, lower and diagonal flats, and the side flats being at least less indented.

4,953,863

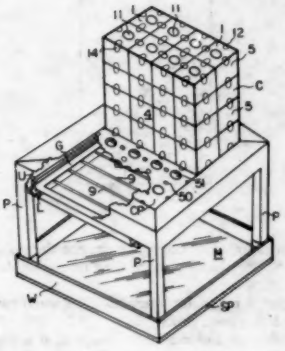
GAME ASSEMBLY

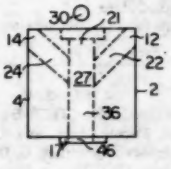
Douglas D. Zeidler, and Dennis E. Zeidler, both of Rte. 1, Box 69M, Floyds Knobs, Ind. 47119

Filed Apr. 5, 1989, Ser. No. 333,988

Int. Cl.[5] A63B *7/00*

U.S. Cl. 273—113 **17 Claims**





1. A game assembly, comprising in combination:

A. a plurality of balls;

B. a plurality of cubes adapted to be stacked in arrays, each cube comprising:

1. six faces, including:
   a. a top face;
   b. a bottom face; and
   c. four side faces;
2. engagement means, including:
   a. a first engagement means on the top face;
   b. a second engagement means on bottom face;
3. an opening in the center of the top face;
4. an opening along the edge of the intersecting side faces and the top face of each cube;
5. entry passageways running from each opening to a common chamber within said cube;
6. at least one exit passageway in communication with said common chamber;
7. an exit opening in operative relationship with said exit passageway in the area of the bottom face of said cube;
8. said exit passageway being in operative relation with

the entry openings or the center opening of an adjacent cube;

C. a plurality of interconnected passages formed by an array of stacked cubes allowing uninterrupted passage of said plurality of balls through different passageways;

D. a board in spaced and parallel relationship to the bottom plane of said arrays of stacked cubes, comprising:

1. two or more designated areas for collection of balls dropped through said stacked cubes.

4,953,864

METHOD AND APPARATUS FOR CHANCE CONTROLLED FORMATION OF A SYMBOL

Daniel Katz, 531 E. 20th St., New York, N.Y. 10010

Filed Jun. 21, 1989, Ser. No. 369,615

Int. Cl.[5] A63F *9/18*

U.S. Cl. 273—161 **46 Claims**

1. A method for determining by chance the state for each of a plurality of lines having more than one possible state, comprising the steps of:

(a) inducing a magnetic interaction between two randomly selected magnetic poles;

(b) assigning to said magnetic interaction a predetermined one of the possible states for a line;

(c) obtaining a visual representation of a line in accordance with said assigned state; and

(d) repeating steps (a)–(c) until the state of each line is visually apparent.

4,953,865

PUTTING PRACTICE DEVICE

Donald W. Coombs, Tucson, Ariz., and Andrew A. Anderson, Antioch, Ill., assignors to Matthew C. Dunne, Tucson, Ariz.

Filed Sep. 27, 1989, Ser. No. 413,251

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—176F **10 Claims**

9. A putt practice device comprising in combination:

(a) an elongated, narrow, flexible, planar base having an upper putting surface, a putting end, and a target end, and a longitudinal center axis, the base including a thin, flexible steel plate and a thin layer of carpet material uniformly disposed on the steel plate, the combined thickness of the steel plate and the layer of carpet being approximately one-fourth of an inch;

(b) first and second rows of means attached to said base and extending upward from the upper surface and positioned parallel to and symmetrically disposed about the center axis for defining a putting path along the upper surface.

4,953,866

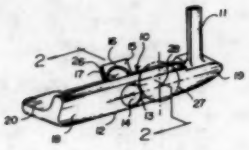
GOLF PUTTER HAVING A MIRROR

Kook B. Bang, 115 Bryn Mawr Ave., Newtown Square, Pa. 19073

Filed Jul. 20, 1989, Ser. No. 382,274

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—183 D **5 Claims**



1. A golf putter comprising:

a putting shaft,

a putting head having a front ball striking face and a rear face,

viewing means extending through the putting head, below the upper edge of said front ball striking face, and extending from said ball striking front face to the rear face thereof, and

a supporting plate containing a mirror mounted to the rear face of the putting head and extending at an angle of 45° from the rear face, said mirror being mounted in horizontal alignment with the viewing means disposed in the putting head, whereby the golfer, from a putting position can view both the ball and the flag marking the location of the hole by looking at the surface of the mirror to see through said viewing means.

4,953,867

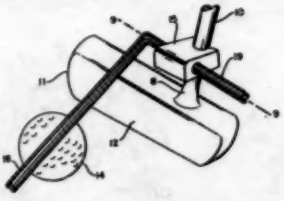
GOLFER'S TRAINING AID

Bill B. Rigsby, 7707 Queensferry, Dallas, Tex. 75248

Filed Oct. 31, 1988, Ser. No. 264,776

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—183 D **4 Claims**



3. In a conventional golf ball putter having a hand held shaft terminating in a putter head with a ball striking face, the improved training means, comprising:

a. a one-piece pliable bracket slideably engaging said shaft,

b. an alignment piece comprising solely a pointer and an arm slideably and rotatably engaging said bracket,

c. a shaft clamping opening in said bracket, and

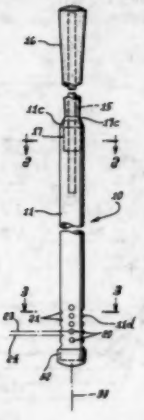
d. an alignment piece engaging opening in said bracket adapted to position said pointer of said alignment piece in alignment with the center of a golf ball and an imaginary target line toward a golf cup for training purposes.

4,953,868

GOLF SWING TRAINING DEVICE

Stanley C. Thompson, 2707 S. Fairfax Ave., Culver City, Calif. 90232, and Elmer R. Fredericks, 5355 Caminito Providencia, Rancho Santa Fe, Calif. 92067

Filed Nov. 24, 1989, Ser. No. 441,044
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186 A **9 Claims**



1. In a swing training device usable by a golfer, the combination comprising

(a) an axially elongated lightweight tubular shaft adapted to be swung by a golfer to produce either a desirably accelerated or insufficiently accelerated swing, corresponding respectively to a desirably or insufficiently accelerated swing of a golf club, relative to a golf ball, the shaft having a longitudinal bore and an exterior surface,

(b) the shaft having, and confined near one end thereof, through holes intersecting said bore and said exterior surface, to produce a distinctive audible sound when said lightweight shaft is swung so as to define a desirably accelerated swing, the holes spaced about said axis,

(c) means for closing said one end of the tubular shaft,

(d) and a golf club shaft section extending into the opposite end of the tubular shaft, remotely from said holes and being bonded to said bore, and a golf club grip on said golf club shaft section, exteriorly of said tubular shaft.

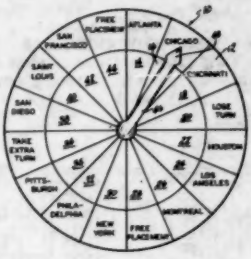
4,953,869

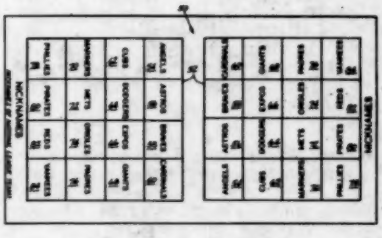
LEARNING GAME

Annie Muhammad, 168 Frank St., New Haven, Conn. 06519

Filed Aug. 31, 1989, Ser. No. 401,234
Int. Cl.[5] A63F *3/06, 9/18*
U.S. Cl. 273—236 **5 Claims**

1. A learning game for a particular factual subject, said game comprising a spin wheel bearing spin wheel designators including question-asking designators appropriate to the subject, a plurality of markers and a related game board including a plurality of identical displays, one for each player, each said display having thereon designators among which are designators providing correct answers to all said question-asking designators, and said display also having thereon a designator which gives an answer to some question relating to the subject but which is not the correct answer to any question posed by said question-asking designators, said display designators to be covered by markers as the game is played, and said spin wheel designators including a non-question asking designator giving





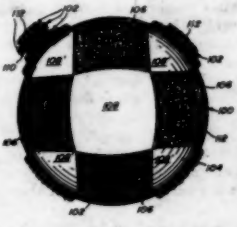
a player spinning the same the opportunity to place a marker on any board designator.

4,953,870

TOSSABLE STRATEGY-TYPE GAME WITH TRI-DIMENSIONAL PLAYING SURFACE

Richard Norman; Sonja Norman, both of Sutton, and David Chamberlain, Knowlton, all of Canada, assignors to Profitable Entertainment Products, Inc., Knowlton, Canada

Continuation of Ser. No. 104,992, Oct. 6, 1987, abandoned. This application Oct. 16, 1989, Ser. No. 421,363
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—241 **23 Claims**



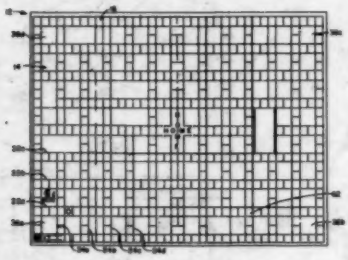
1. A tossable, lightweight, tri-dimensional game comprising:

a tri-dimensional body to be tossed and caught during play, said body including an endless playing surface; said endless playing surface including distinct areas defining at least first and second visually distinguishable surface areas forming an uninterrupted alternating pattern; and

a plurality of playing pieces, said playing pieces each having attachment means for being releasably attached to at least said first surface areas with sufficient strength to be re-

tained on said selected surface areas during tossing while enabling said playing pieces to be manually detached from said selected surface areas.

4,953,871
TRAFFIC BOARD GAME
Samuel Antwi, 1 - 15 Litchfield Gardens, Winsted, Conn. 06098
Filed Nov. 22, 1988, Ser. No. 274,916
Int. Cl.[5] A63F *3/00, 9/18*
U.S. Cl. 273—252 **13 Claims**



1. A board game apparatus of the type wherein each player moves a respective game piece along a playing surface, comprising:

a plurality of playing pieces, each representing a vehicle to be controlled by a respective player;

board means defining a playing surface substrate;

a playing surface supported by the board means, said playing surface having differentiated markings thereon including,

symbolic representations of the topography of a hypothetical community including a multiplicity of intersecting roadways,

means for dividing each roadway into a multiplicity of distinct, serially connected road segment intervals along which the game pieces are to be moved,

a first class of indicia associated with some of the road segment intervals, for defining a plurality of first traffic control parameters that influence the movement of the game pieces, each of the first parameters having a respective point value associated therewith, and

a second class of indicia associated with some of the road segment intervals, for indicating the occurrence of unusual events when traversed by a game piece;

chance means for specifying the number of road segment intervals that a player can move a game piece along a roadway during a given turn;

a plurality of event cards, one of which must be taken by a player upon traversing a roadway interval having said second class of indicia associated therewith, some of the event cards describing a particular one of a respective plurality of possible traffic violations;

a police report sheet containing,

a list of all violations appearing on said event cards,

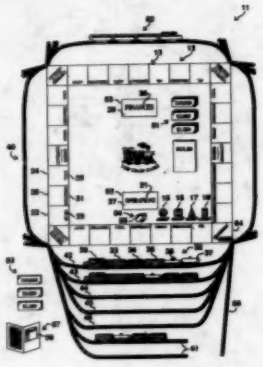
a question corresponding to each violation on the list, each question pertaining to automotive safety or traffic laws,

a correct answer to each of said questions, and

a point value associated with each violation on the list.

4,953,872
TRANSPORTATION INDUSTRY GAME
Gerald C. Schultz, R.R. 1, Box 47, Bloomfield, Mont. 59315
Filed Aug. 3, 1989, Ser. No. 388,842
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—254 **20 Claims**

1. A method of playing a transportation industry game including the steps of providing a playing surface with a plurality of adjacent areas forming a first continuous pathway around said surface, a distinguishable marker for each player, a common money supply source, money and stock for each player, each player in a repeating sequence activating random number selection means, advancing the player's marker along said first pathway the number of areas specified by said number selection means to stop on a particular area, reading the legend on said area and performing the action specified, when the legend corresponds to a miniature drive or commodity carrier unit



selecting the particular unit and assembling it with a previously selected miniature unit disposed adjacent to a second continuous pathway surrounding said first pathway, when the legend corresponds to that of a particular stack of cards selecting the top card therefrom and performing the action specified, transferring stock and money when specified, moving unit assemblies along said second pathway to fulfill contracts when specified; whereby each player attempts to maximize assets during the playing of the game.

4,953,873
METHOD OF AND MEANS FOR PLAYING A SPORTS GAME OF CHANCE
Michael R. Jacobson, 4-5-39 #105, Minami Azabu, Minato, Tokyo, Japan 107
Filed Apr. 24, 1989, Ser. No. 342,166
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—274 **1 Claim**

1. A method of playing a sports game of chance, comprising the steps of:

providing a game board displaying all the possible play outcomes for a particular sport and the odds of each said play or sequence of plays occurring;

providing a plurality of chips of varying value to each individual player;

assigning to one of said players the responsibility for the control of said chips, said controlling player to be known as the banker;

having each player place said chips on the position on said game board corresponding to said play or sequence of plays they believe will occur, said board position being referred to as a placement square;

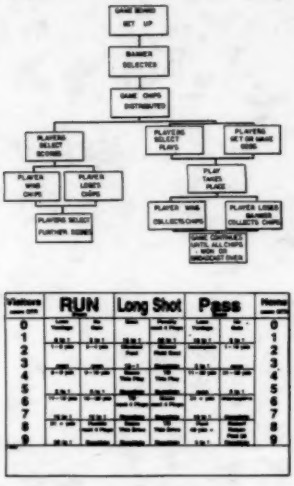
observing said play on the broadcast of said sports game;

having said banker pay out the proper number of said chips based upon the number of said chips bet times said odds shown on said placement square of said game board;

having said banker remove said chips on the game board on said positions of said game board that did not occur during said play;

continuing said game in the above-described manner until one player has won all of said available chips;

allowing said game board display to have said odds on a number of said placement squares and allowing said certain other placement squares to have open negotiated odds; and



permitting said negotiated odds to be accepted or rejected by said banker.

4,953,874

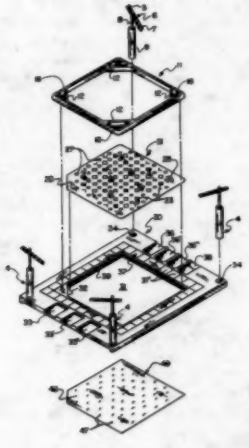
EDUCATIONAL MARBLE BOARD GAME

Gary L. Golomb, 2021 E. Wood St., Tampa, Fla. 33604

Filed Dec. 21, 1989, Ser. No. 453,822

Int. Cl.[5] A63F *7/28*

U.S. Cl. 273—355 **14 Claims**



1. Marble board game comprising a game board and accessories,

the game board including

a playing field indented by rest positions for marbles launched onto the playing field, wherein the surface of the playing field between marble rest positions is higher than the marble rest positions and is generally uneven, and marble rest positions contain therein answers to questions and have associated therewith questions to which such answers are the correct answers displayed on the board adjacent respective marble rest positions containing their correct answers;

the accessories including

marbles launchable onto the playing field to occupy such rest positions, and means for so launching the marbles.

4,953,875

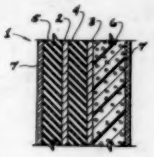
ELECTRICALLY SHORTING TARGET

Moises Sudit, 73 Forestbrook Ct., Getzville, N.Y. 14068

Filed Jul. 24, 1989, Ser. No. 383,587

Int. Cl.[5] F41J *5/04*

U.S. Cl. 273—373 **16 Claims**



6. An electrically responsive target for registering projectile contact which comprises sequentially abutting each other a front insulating layer, a front electrode, an intermediate insulating layer, a rear electrode, and a back insulating layer, said front electrode being a metallic foil having a thickness of at least 0.005 inches thick, said intermediate layer being an open cell foam insulator having a thickness of at least 0.10 inches thick, and wherein said rear electrode is a metallic wire screen having a mesh of about 15 to about 50 and having means to electrically connect said target to an electrical circuit.

4,953,876

SEALING RING STRUCTURE

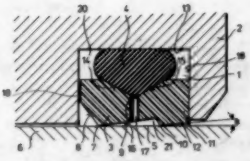
Heinz K. Müller, Waiblingen, Fed. Rep. of Germany, assignor to Busak & Luyken GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Nov. 16, 1988, Ser. No. 272,193

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1987, 3738988

Int. Cl.[5] F16J *15/24, 15/32, 15/56*

U.S. Cl. 277—165 **4 Claims**



1. Sealing ring structure for sealing the gap between two concentric machine parts which are arranged for linear movement relative to each other, the first machine part being provided with a groove having a bottom and axially spaced and opposed sides connected by said bottom while the second machine part comprises a plain contact surface arranged opposite the said groove, the said sealing ring structure comprising a sealing ring made of a tough-elastic plastic material fitted into the groove, said sealing ring having a high pressure end and a low pressure end, and having first and second circumferential surfaces disposed between said ends, said first circumferential

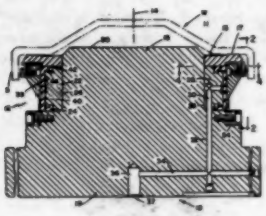
surface facing said contact surface and said second circumferential surface facing the bottom of the groove, and being provided with sealing edges which are arranged spaced from said ends on said first circumferential surface facing the said contact surface and by which the sealing ring bears against the contact surface of the second machine part, and being further provided with an annular recess arranged in said second circumferential surface facing the bottom of the groove, the sealing ring structure comprising further a stressing ring made of a rubber-elastic material arranged between the said sealing ring and the bottom of the groove, in the recess provided in the second circumferential surface of the sealing ring, the axial extension of the said stressing ring between the axially spaced and opposed sides being smaller than that of the sealing ring, the improvement wherein the said recess is provided in the area between the two sealing edges of the said sealing ring, and the dimensions of said recess are selected so that its width decreases as its depth rises, and that the said stressing ring engaging said recess is free to shift towards the low-pressure end of the sealing ring and the sealing ring includes at least one radial bore communicating between the space defined between the two sealing edges and the bottom of the said recess.

4,953,877

FLUID ACTUATED CHUCK

Gene Slachta, 494 E. Morley, Saginaw, Mich. 48601, and Kim F. Stemler, 744 Basloms, Saginaw, Mich. 48603

Filed Sep. 23, 1988, Ser. No. 248,045
Int. Cl.[5] B23B *31/40*
U.S. Cl. 279—2 A **11 Claims**



1. A chuck for holding and gripping a thin, easily distortable hollow workpiece having a peripheral wall radially adjacent to said chuck to be gripped comprising:

a. a rigid chuck body having an axis and a cylindrical mounting surface concentric with said axis;

b. a plurality of generally axially extending, generally coextensive, discrete flexible chuck fingers circumferentially spaced from one another throughout their length;

c. means individually removably axially fixing one end of each finger on said mounting surface, each of said fingers having an opposite free end spaced axially from said mounting surface and swingable radially relative to said axially fixed end to radially grip said peripheral wall of a radially adjacent workpiece;

d. an inflatable pliant ring concentrically mounted axially fixedly on said chuck body radially between said body and fingers radially adjacent and in operative engagement with portions of said fingers spaced from said axially fixed ends; and

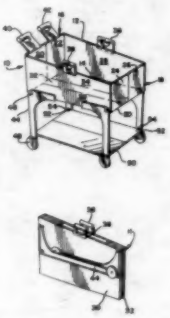
e. means for inflating said ring with fluid under pressure to expand it to move said free ends of the fingers individually radially to grip said workpiece, and for deflating said ring to permit said free ends to return radially to release said workpiece.

4,953,878

COLLAPSIBLE CART

Frank J. Sbragia, Rt. 1, Box 2377 Checker Rd., Long Grove, Ill. 60047

Filed Oct. 31, 1988, Ser. No. 265,060
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—30 **5 Claims**



1. A unitary collapsible cart comprising an upper body portion, a lower planar surface and legs for supporting said upper body portion; said upper body portion defining an upper compartment, said upper compartment having opposing side walls, foldable end walls hingedly secured to said side walls and a foldable bottom having a first and a second panel, each of said first and second panels hingedly attached to one of said side walls, and a third panel attached to each of said first and second panels in a hinged manner so that said bottom can be folded into a tri-fold shape, said legs being pivotably secured to said upper body portion to permit the folding of said legs to a position adjacent said upper body portion; said lower planar surface being removably secured to each of said legs and having at least two planar panels hingedly attached along a longitudinal axis; said legs and said cart being held in an unfolded, open position by said lower planar surface, removal of said lower planar surface permits the cart to be collapsed into a compact rectangular shape.

4,953,879

MOVABLE DISPLAY RACK

Bertram J. Cain, Portage; Wesley S. Devon, Grand Rapids, and Ronald F. Patton, Muskegon, all of Mich., assignors to Cole's Quality Foods, Inc., Muskegon, Mich.

Filed Dec. 30, 1988, Ser. No. 292,389
Int. Cl.[5] B62B *1/00*
U.S. Cl. 280—47.19 **15 Claims**

1. A movable display assembly for products including bakery goods or the like comprising:

a pair of spaced, generally upright, lateral supports, each support including front and rear legs, a top bar and a bottom bar, said front legs being longer than said rear legs, each said bottom bar sloping downwardly and forwardly to a floor engaging portion below its respective front leg;

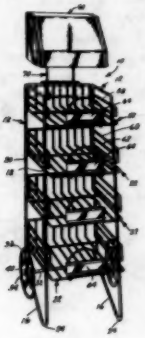
a pair of spaced wheels, one wheel rotatably mounted adjacent the bottom end of each rear leg;

a plurality of vertically spaced shelves mounted between said lateral supports;

side retention means on said legs adjacent to and spaced above each shelf for retaining items on said shelves at the sides thereof; said side retention means and shelves each extending beyond the front surface of said front legs of said lateral supports;

front retention means on each of said shelves for retaining items on said shelves at the front thereof; said front retention means being mounted on each said shelf at a position spaced forwardly of said front legs;

rear retention means extending adjacent said rear legs and adjacent and above each shelf for retaining items on said shelves at the rear thereof;



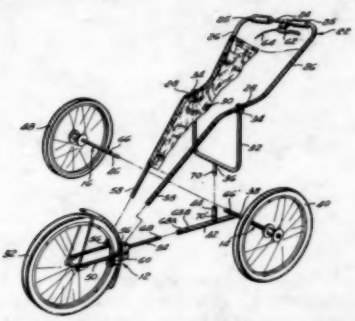
said shelves being supported in front of said wheels such that the weight of said shelves and any items thereon will urge said floor engaging leg portions toward the floor or other support surface; said assembly being tiltable off said floor engaging portions for movement on said wheels.

4,953,880

JOGGING STROLLER

Carle H. Sodakoff, and Billie D. Matthews, both of San Clemente, Calif., assignors to Tandem Mfg., Inc., San Clemente, Calif.

Filed Jan. 23, 1989, Ser. No. 299,132
Int. Cl.[5] B62B *7/14*
U.S. Cl. 280—47.38 **7 Claims**



1. A three wheeled stroller comprising:

a base frame formed of an elongate longitudinal spine member having a front end and a rear end, the rear end of said elongate longitudinal spine member being connected normally to a transverse rear axle member to form a generally T-shaped base frame configuration;

a front wheel receiving fork formed on the front end of said longitudinal spine member of said base frame;

an inclined upper frame assembly having left and right frame members, a front end, a rear end and a handlebar formed on the rear end thereof;

a seat suspended from said upper frame assembly;

a generally U-shaped vertical support member hingedly attached to said left and right frame members of said upper frame assembly and extending between said base frame and said upper frame assembly to hold said upper frame assembly in a substantially fixed position on said base frame;

means for releasably attaching the lower end of said vertical support member to said spine member and means for releasably attaching the front end of said upper frame assembly to said front wheel receiving fork;

a front wheel rotatably mounted within said front wheel receiving fork;

a right rear wheel rotatably mounted on the right end of said transverse rear axle; and

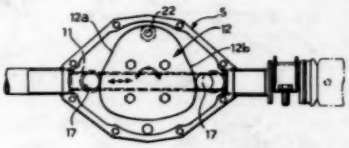
a left rear wheel rotatably mounted on the left end of said transverse rear axle.

4,953,881

MECHANICAL STEERING DEVICE FOR THE REAR WHEELS OF MOTOR CARS WITH FOUR-WHEEL STEERING

Giorgio Lupo, Rivalta, and Pier Carlo Capra, Turin, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Apr. 7, 1989, Ser. No. 334,506
Claims priority, application Italy, Apr. 11, 1988, 67323 A/88
Int. Cl.[5] B62D *3/02*
U.S. Cl. 280—91 **5 Claims**



1. A mechanical steering device for the rear wheels of motor cars with four-wheel steering, including a front steering unit, a rear steering unit and a longitudinal transmission shaft coupling for rotation said front and rear steering units, and for rotation said front and rear steering units, and in which the rear steering unit comprises a transverse bar and respective steering joints and tie rods connecting said transverse bar to the rear wheels, and transmission means for transforming the rotation of the longitudinal shaft into translation of the transverse bar, wherein the transmission means are constituted by a positive cam (**12**), said cam (**12**) being constituted by a plate which is rotatable about an axis perpendicular to the transverse bar (**11**) and which is provided with convexo-concave lateral active profiles (**12*a***, **12*b***) against which two roller-followers (**17**) carried by the transverse bar (**11**) react from opposite sides.

4,953,882

TRANSMISSION APPARATUS FOR BICYCLE OR LIKE PEDAL-OPERATED VEHICLE

Chester L. Craig, Jr., 3460 Cuervo La., Yuma, Ariz. 85365

Filed Mar. 29, 1989, Ser. No. 330,185
Int. Cl.[5] B62M *1/04*
U.S. Cl. 280—258 **10 Claims**

1. A pedal driven vehicle comprising:

a frame;

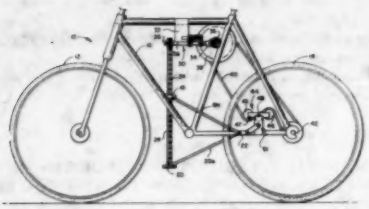
at least one driven wheel mounted on said frame for, when driven, providing locomotion of the frame;

first and second pedals mounted on the frame so as to move up and down alternately, in tandem;

an elongate flexible drive chain disposed in a plane perpendicular to the plane of the frame and connected at the ends thereof to said pedals and movable back and forth in opposite directions in response to the up and down movement of the pedals, and

transmission means, connected between the drive chain and

the driven wheel and driven by said drive chain, for converting the back and forth motion of the drive chain into rotary motion used in providing rotation of said driven wheel, said transmission means including first and second concentric driven shafts extending parallel to the longitudinal axis of the frame, means driven by said drive chain for providing rotation of said first and second driven shafts in opposite directions in response to downward



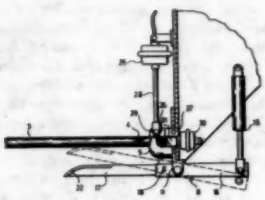
movement of respective pedals of the first and second pedals, and means for converting rotation of one of said shafts in a first direction into rotation of the other shaft in the opposite direction so that irrespective of which pedal is moved downward said other shaft is caused to rotate in the same direction, and output means driven by said other shaft and operatively connected to said driven wheel to provide rotation thereof.

4,953,883

TRUCK TRAILER HITCH

Simon Helie, 500, Rivière Baionne Sud, Berthierville (Quebec), Canada J0K 1A0

Filed Apr. 26, 1989, Ser. No. 344,242
Int. Cl.[5] B60D *1/04, 1/26*
U.S. Cl. 280—477 **12 Claims**



1. A trailer hitch for hitching to a motor vehicle a trailer having a draw pole with a first end attached to the trailer and with a second end which is free, the trailer hitch comprising:

a first coupling member secured to the second end of the draw pole, the first coupling member comprising a coupling ring secured to the second end of the draw pole;

a second coupling member fixedly attached to the motor vehicle and engageable with the first coupling member to hitch the trailer to the said motor vehicle, the second coupling member comprising an upwardly projecting pintle hook with an upper free end fixedly attached to the said motor vehicle;

an arm pivotally mounted on the motor vehicle through a substantially horizontal pivot, said arm having a free end distant from the said pivot and provided with means for supporting the said draw pole, the substantially horizontal pivot being lower than the said pintle hook;

said draw pole supporting means comprises the free end of the pivoting arm formed with an arcuate, convex surface for engaging the underside of said draw pole

arm rotating means for rotating said pivoting arm about a substantially horizontal pivot, the arm rotating means comprising means for rotating the said arm about a pivot in a first direction of rotation with the draw pole supported by the said arcuate, convex surface to lift the coupling ring until the same is higher than the upper free end of the pintle hook, whereby said coupling ring may be positioned above the pintle hook by moving the motor vehicle toward the trailer with the draw pole sliding on the arcuate surface;

said arm rotating means also comprising means for rotating said pivoting arm about the substantially horizontal pivot in a second direction of rotation opposite to the first rotation direction with the draw pole supported by the arcuate surface when the coupling ring is above the pintle hook in order to lower the coupling ring on the pintle hook and thereby engage the said ring with the said pintle hook; and

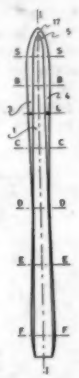
whereby, in operation, said pivoting arm is rotated about said pivot with the free end of the arm supporting the draw pole in order to control in height the position of the pole, the second end and the first coupling member and thereby enable engagement of the said first coupling member with the second coupling member.

4,953,884

SKI HAVING A VARIABLE WIDTH UPPER SURFACE

Jean-Luc Diard, and Francois Guers, both of Annecy, France, assignors to Salomon S.A., Annecy Cedex, France

Filed Jul. 13, 1988, Ser. No. 218,144
Claims priority, application France, Jul. 15, 1987, 87 10330
Int. Cl.[5] A63C *5/48*
U.S. Cl. 280—609 **42 Claims**



1. A ski for use on snow comprising:

(a) a longitudinally extending body having a central region interposed between an anterior segment as the front of the ski terminating in a spatula and a posterior segment at the rear of the ski;

(b) said body having a lower sliding surface connected to two lateral side surfaces defining a pair of opposed lower edges;

(c) the two lateral side surface of the body being inclined relative to the lower surface, and being connected to an upper surface; and

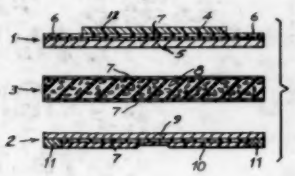
(d) said upper surface having a width defined by two upper edges which converge in both the anterior and posterior segments, the width decreasing from the rear of the ski in the posterior segment thereof towards the front of the ski in said anterior segment.

4,953,885

SKI CONSTRUCTION

Ahmet Comert, Chaineux; Michel Ladang, Herve, and Dominique Petit, Housse-Blegny, all of Belgium, assignors to Norton Company

Filed Oct. 21, 1987, Ser. No. 111,384
Int. Cl.[5] A63C 5/00
U.S. Cl. 280—610 8 Claims



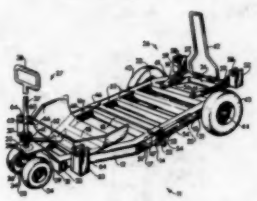
1. A laminated ski having a top surface bearing section, a bottom surface bearing section, a core section therebetween, wherein a bonding layer is provided between the top and bottom surface bearing sections and said core section, wherein said bonding layer is a hot melt adhesive, wherein said hot melt adhesive contains an predetermines amount of an adhesion promoter, and a boot pad adhesively attached to the base of said top surface bearing section with a hot melt adhesive containing an predetermined amount of an adhesion promoter.

4,953,886

MOBILE STRETCHER SUPPORT

Fred W. Grant, 3177 Terrace Ct., Apt. H, Norcross, Ga. 30092

Filed Jul. 21, 1989, Ser. No. 382,911
Int. Cl.[5] A61G 1/00
U.S. Cl. 280—640 10 Claims



1. An emergency hand truck comprising an elongated flat frame member having front and rear sections,

a first pair of wheels mounted at the front of said front section and a second pair of wheels mounted approximately at the rear of said rear section, said first pair of wheels being swivelly mounted to said frame,

means for steering said truck comprising means for swiveling said first pair of wheels,

and means for supporting a litter on said truck above said frame comprising first and second elongated flat plates, each having one end mounted to said frame adjacent a front corner thereof, and third and fourth elongated flat plates each having one end mounted to said frame adjacent a rear corner thereof,

each of said flat plates having an upstanding support arm having its lower end mounted to the distal end of said flat plate and having a notch formed in its upper end, and a support plate extending from said support arm toward the mounted end of said flat plate, said support plate having a concave upper edge curving down and away from said support arm,

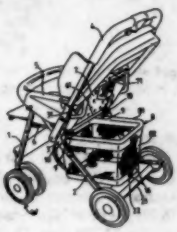
whereby said means for supporting a litter supports the handles of a stretcher in the notched ends of said support arms, or supports a Stokes basket type litter on the curved upper edges of said support plates.

4,953,887

BABY CARRIAGE CAPABLE OF SERVING AS SHOPPING CAR

Takehiko Takahashi, and Hitoshi Kato, both of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,709
Claims priority, application Japan, Jul. 18, 1988, 63-93994[U]; Aug. 3, 1988, 63-102941[U]
Int. Cl.[5] B62B 9/12
U.S. Cl. 280—647 4 Claims



2. A baby carriage capable of serving as a shopping car comprising a frame, a seat plate, a back rest means and a plurality of wheels mounted to said frame; further wherein an article-holding container of which an upper end defines a larger opening is detachably mounted below said seat plate at a rear portion of said seat plate on which seat plate a baby is to be seated; said article-holding container includes a frame bar having a U-shape as seen from above and engaging members mounted respectively on upper surfaces of front end portions of said frame bar; and said engaging members are detachably fitted respectively in holders mounted on the underside of said set plate at opposite sides of said seat plate, wherein each of said holders is pivotally movable at said rear portion of said seat plate about a mounting arm formed on the upper surface of each said holder body at its proximal end portion and serving as a fulcrum for said pivotal movement.

4,953,888

LUGGAGE CART

Edward B. Stein, Chicago, Ill., assignor to Stebco Products Corporation, Chicago, Ill.

Continuation of Ser. No. 124,506, Nov. 23, 1987, abandoned. This application Aug. 7, 1989, Ser. No. 390,406
Int. Cl.[5] B62B 1/12
U.S. Cl. 280—654 32 Claims

1. In a collapsible luggage cart including an axle, wheels mounted thereon, an upright stand mounted on the axle and a luggage carrier pivotably mounted on the cart and being pivotally movable from a upright storage position to a generally horizontal luggage carrying position, the improvement comprising a swingable latch bar swivelly mounted only at one end on the luggage carrier and selectably movable in a plane substantially parallel to the luggage carrier from a storage position to a luggage carrier locking position, latch means carried on an opposite end of said bar and locking the latch bar in said storage position with said luggage carrier so as not to interfere with pivoted folding movement of the luggage carrier and also alternatively locking the latch bar to said luggage carrier when the carrier is in the generally horizontal luggage carrying position for ready transport of luggage, the latch bar extending

along the length of the luggage carrier when in said upright storage position and extending transversely of the luggage

carrier and adjacent and abutting said upright stand when the luggage carrier is in said luggage carrying position.

4,953,889

ADJUSTMENT OF CAMBER IN FOUR WHEEL DRIVE

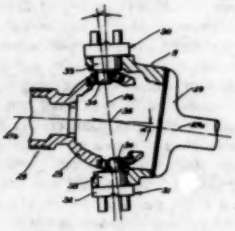
Bruce J. Reilly, Lot B & C, Campbell Street, Narellan, New South Wales, Australia, assignor to Bruce John Reilly and Joyce Lynette Reilly, both of New South Wales, Australia

Continuation of Ser. No. 97,774, Sep. 18, 1987, abandoned. This application Feb. 21, 1989, Ser. No. 312,393

Claims priority, application Australia, Sep. 18, 1986, PH8099

Int. Cl.[5] B62D *17/00*

U.S. Cl. 280—661 **8 Claims**



1. A complementary pair of upper and lower king pin bearing caps for providing camber adjustment in a closed knuckle steering system, each bearing cap comprising:

a backing plate rigidly connectable to said closed steering knuckle;

a first part extending from said backing plate and engageable in said closed steering knuckle; and

a second part extending eccentrically from said first part, said second part being engageable rotatably in an axle tube end of said closed knuckle steering system;

eccentricity between said first and second parts providing camber adjustment when said complementary upper and lower bearing caps are installed in said closed knuckle steering system.

4,953,890

SUSPENSION APPARATUS OF A VEHICLE

Shoichi Kamimura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 30, 1989, Ser. No. 443,477

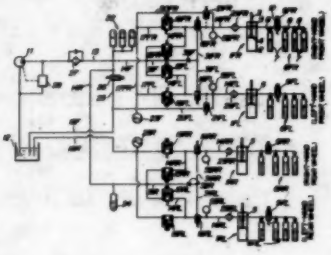
Claims priority, application Japan, Nov. 30, 1988, 63-300858

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—707 **33 Claims**

1. A suspension apparatus of a vehicle, in which each of wheels is provided with an actuator for controlling a height of a vehicle body in accordance with a supply or discharge of an operating fluid and the supply or discharge of the operating fluid to or from the actuator is controlled in accordance with a predetermined condition;

wherein acceleration in a vertical direction acting upon the



vehicle body is used as a control parameter for determining a control value for supplying or discharging the operating fluid; and

wherein three sensor means for sensing the acceleration in the vertical direction are provided so as to define a virtual plane extending in a substantially horizontal direction.

4,953,891

CONNECTING STRUCTURE FOR CONNECTING A SPRING AXLE SUSPENSION TO A VEHICLE CHASSIS

Johan M. Zantinge, Rheden, Netherlands, assignor to Wewler N.V., Apeldoorn, Netherlands

Filed Jan. 6, 1989, Ser. No. 294,164

Claims priority, application Netherlands, Jan. 7, 1988, 8800027

Int. Cl.[5] B60G *7/02*

U.S. Cl. 280—788 **20 Claims**

1. Connecting structure adapted to be connected to a vehicle chassis, for connecting a spring axle suspension to a vehicle chassis, characterized in that the spring axle suspension engages with a part which is rigid in the transverse and lengthwise direction of the vehicle, and which is fastened underneath to a chassis bar running in the lengthwise direction of the vehicle, with a longitudinal strip; said longitudinal strip forming a much narrower fastening part in the transverse direction of the vehicle, also much narrower than said chassis bar, while two opposite rigid parts with which said axle suspension engages are connected by a transverse connection to form a rigid unit.

4,953,892

SKI POLE CLIP

Keith W. Adkins, E. 1644 Nebraska, Spokane, Wash. 99207

Filed Apr. 21, 1989, Ser. No. 341,542

Int. Cl.[5] A63C *11/22*

U.S. Cl. 280—814 **8 Claims**

1. In combination, a ski pole and a clip for attaching the ski

pole to a ski lift, the ski lift including a ski pole mounting structure having substantially horizontal extending bar with a substantially circular cross-section, the combination comprising:

a ski pole having a handle portion, a basket portion, and a shaft portion, the shaft portion interconnecting the handle portion and the basket portion and tapering from a larger diameter portion adjacent the handle portion to a smaller diameter portion adjacent the basket portion;

a clip attachable to the ski pole, said clip, including a first clip body portion, having a longitudinal shaft aperture extending therethrough defined by a pair of substantially semi-cylindric wall formations, outer ends of said wall formations being spaced apart to define a first passage means adapted for permitting entry of said smaller diameter portion into said shaft aperture by lateral movement of said smaller diameter portion relative to said clip and adapted for preventing exit of said larger diameter portion

from said shaft aperture by lateral movement of said larger diameter portion relative to said clip, the shaft being movable within said shaft aperture from said smaller diameter portion to a position adjacent said handle portion by longitudinal movement of said shaft relative to said clip, said clip further including a second clip body portion coupled to said first clip body portion and attachable to the ski pole mounting structure, said second clip body portion including a mounting structure aperture extending therethrough and defined by a substantially semi-cylindric second wall formation having outer ends spaced apart to define second passage means adapted for permitting entry of the ski lift mounting structure into said mounting structure aperture whereby the longitudinal axis of said shaft aperture extends substantially vertically and said second passage means comprises a substantially downwardly facing opening when said bar of said ski lift is received within said mounting structure aperture.

4,953,893

SELF-DETACHABLE BICYCLE AUXILIARY WHEEL BRACKET STRUCTURE

K. H. Hsiao, No. 4, Lane 11, Tzu Chiang St., Tu Cheng Shiang, Taipei Shien, Taiwan

Filed Aug. 4, 1989, Ser. No. 389,406

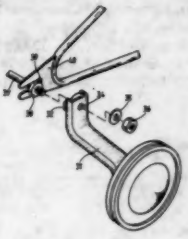
Int. Cl.[5] B62H *13/00*

U.S. Cl. 280—293 **2 Claims**

1. A bracket for detachably securing an auxiliary wheel to a bicycle of the type having a rear fork provided with a front notch formed therein and the threaded end of a free-wheel axle being disposed through the front notch and secured to the rear fork by a nut, with a portion of the threaded end extending outwardly from the nut, which bracket comprises:

(a) a bracket body having a recess formed therein, the recess being defined by a lateral side wall and a bottom wall; and a through-hole formed in the center of the bottom wall;

(b) the recess being sized to receive the nut securing the free-wheel axle to the rear fork of a bicycle and permit a portion of the threaded end of the axle extending outwardly of the nut to extend through the through-hole for engagement by a washer and nut assembly to secure the bracket to the axle; and



(c) a pair of projecting rods extending outwardly from opposite sides of the recess side wall, the rods being engageable within the front notch of the rear fork when the bracket is connected to the axle.

4,953,894

ADJUSTABLE FASTENING OF A BALL JOINT TO A TRACK ROD FOR STEERING RODS OF MOTOR VEHICLES

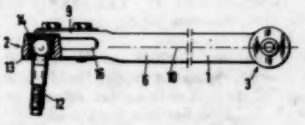
Lothar Broszat, Monheim; Michael Servos, and Dieter Schnitzler, both of Hilden, all of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 8, 1988, Ser. No. 268,502

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1987, 3739704

Int. Cl.[5] B62D *7/20*

U.S. Cl. 280—846 **13 Claims**



1. An adjustable fastening of a ball joint (2) to a track rod (1) for steering rods of motor vehicles, the ball joint (2) having a ball stud (12) supported for movement in all directions around a central axis (17) in a joint housing, the central axis (17) being movable relative to the track rod (1) by adjusting the ball joint (2), said adjustable fastening comprising:

a fastening plate (16) associated with the ball joint (2) and having a bearing bore (18) arranged eccentric to the central axis (17) of the ball stud (12);

fastening means (22) for supporting said fastening plate (16) at the bearing bore (18) for swinging movement of said fastening plate (16) between a number of swing positions;

fixing means (23) for gripping said fastening plate (16) to fix the ball joint (2) in a certain swing position; and

wherein the track rod (10) has a forked head (9) which receives between a side wall (7) and another side wall (8) said fastening plate (16) of the ball joint (2).

4,953,895

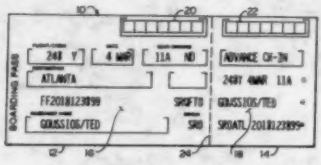
DUAL PURPOSE LOTTERY TICKET AND BOARDING PASS

Theodore Goussios, Sarasota, Fla., assignor to Inspiration Markets, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 332,694, Apr. 3, 1989, abandoned. This application May 22, 1989, Ser. No. 354,924

Int. Cl.[5] B42D *15/00*; A63F *3/06, 3/08*

U.S. Cl. 283—102 4 Claims



1. A dual-purpose lottery play ticket and air carrier boarding pass issued by a commercial passenger air carrier to each passenger boarding an aircraft for commercial flight comprising:

a paper sheet having a first part and a second part separated and partially defined by a tear line of weakness therebetween;

said first and second parts having similar viewable indicia printed thereon describing each passenger by name and information defining a particular scheduled flight designation;

said first part separable from said second part along said tear line of weakness when each passenger boards the aircraft, said first part to be retained by the air carrier for validating each person's entry into a lottery selection;

said second part to be retained by the passenger as proof of entry into the lottery and the selection made;

said first part having an array of spaces defined thereon structured for receiving a randomly selected viewable numerical lottery indicia written within each space of said array;

said second part having array of spaces defined thereon identical to the array of spaces on said first part.

4,953,896

STRUCTURE FOR CONNECTING BRANCH PIPE IN HIGH-PRESSURE FUEL MANIFOLD

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan

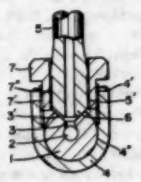
Filed Jun. 27, 1988, Ser. No. 211,969

Claims priority, application Japan, Jun. 29, 1987, 62-99724

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] F16L *41/00*

U.S. Cl. 285—197 6 Claims



1. A structure for connecting branch pipes to a main pipe in a high-pressure fuel manifold, comprising:

a main pipe for supplying fuel under high pressure, said main pipe having a peripheral wall and a longitudinally extending flow passage defined therein, said main pipe comprising at least one through-hole extending laterally through the peripheral wall and communicating with the longitudinally extending flow passage, portions of said peripheral wall surrounding said through-hole defining an outwardly opening recessed pressure bearing surface;

a coupling member having an axially aligned engagement bore extending therethrough and a laterally extending threaded bore extending therethrough and into communication with the axially extending engagement bore, said coupling member being disposed over the main pipe such that the axially extending engagement bore of said coupling member is mounted in engagement with the peripheral wall of said main pipe and such that the laterally extending threaded bore of said coupling member substantially surrounds the outwardly opening recessed pressure bearing surface of said main pipe, said coupling member being secured to the peripheral wall of said main pipe;

a nut having opposed inner and outer peripheries, the inner and outer peripheries of said nut defining respective inner and outer threaded surfaces, the outer threaded surface of said nut being threadedly engaged with the threaded bore of said coupling member, the inner threaded surface of said nut being threaded in an opposite direction to the outer threaded surface thereof; and

a branch pipe having a joint end portion of a configuration conforming to the shape of the outwardly opening recessed pressure bearing surface of the main pipe, said branch pipe having a threaded outer surface adjacent the end portion thereof, said threaded outer surface of said branch pipe being threadedly engaged with the inner threaded surface of said nut, said nut being threadedly tightened relative to said coupling member and said branch pipe such that the joint end portion of said branch pipe is pressed against the outwardly opening recessed pressure bearing surface of the main pipe for achieving secure connection between the branch pipe and the main pipe for delivering high-pressure fuel therebetween.

4,953,897

VENT PIPE COUPLING

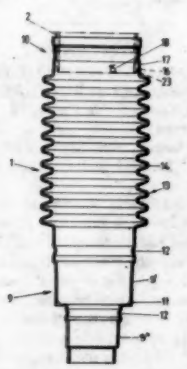
Johannes Klöber, Theodor-Storm-Strasse 4, D-5628 Ennepetal, Fed. Rep. of Germany

Continuation of Ser. No. 272,503, Nov. 16, 1988, abandoned. This application Feb. 16, 1990, Ser. No. 483,272

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 8805399[U]

Int. Cl.[5] F16L *51/02*

U.S. Cl. 285—226 3 Claims



1. A one-piece flexible vent pipe coupling having a single-ply wall comprised of an elastic plastic material of substantially

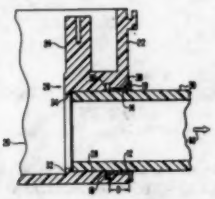
uniform thickness, the wall comprising a cylindrical socket end receiving a first short connection pipe section of a roof vent inserted into the socket end, another cylindrical end connected to a second pipe section of the roof vent and a central compressible bellows portion between the ends, the central bellows portion being comprised of a series of folds including an inwardly projecting end fold adjacent the socket end, the folds of the bellows portion in the relaxed condition thereof defining an inner diameter of the bellows portion which is substantially equal to the outer diameter of the short connection pipe section, the inwardly projecting end fold of the central bellows portion being constricted under compression upon insertion of the short connection pipe section of the roof vent into the socket end and the constricted end fold forming an abutment for the inserted connection pipe section, the elastic plastic material of the cylindrical wall of the socket end of the vent pipe coupling being deformed by depressing the wall material to form an inwardly directed circumferential arcuate protrusion pressing against, and sealingly retaining, the inserted first short connection pipe section, the depression of the wall material forming a circumferentially extending annular groove.

4,953,898

MECHANICAL FASTENER FOR PLASTIC CONDUITS

Robert W. Jorgensen, Niles, Mich.; Vance W. Young, Jr., and Scott L. Misenar, both of South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Mar. 29, 1989, Ser. No. 330,370
Int. Cl.[5] F16L *19/00*
U.S. Cl. 285—340 **4 Claims**



1. A connector structure for attaching an end of a length of generally tubular conduit to a body having a cylindrical recess dimensioned to receive the conduit end through an open end of said cylindrical recess comprising:

means in said cylindrical recess defining an annular recess and an annular inwardly facing shoulder, said annular, inwardly facing shoulder being located in said cylindrical recess a predetermined depth from the open end thereof; and

a retaining clip having

a substantially flat annular ring dimensioned to abut a surface of said body around said open end of said cylindrical recess substantially coaxially with said cylindrical recess, said annular ring having a central opening dimensioned to receive said conduit,

a first plurality of fingers extending inwardly from the inner periphery of said ring at an angle of between about 10° and about 80° from a plane containing said ring,

at least one said finger having a length substantially equal to said predetermined depth which engages said annular shoulder and having at the distal end thereof an outwardly bent portion forming a locking tab dimensioned to engage said annular recess when said finger is flat against the inner surface of said cylindrical recess,

and a second plurality of fingers extending from the inner periphery of said ring for engaging said conduit,

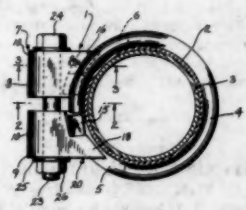
whereby when said ring is place against said body around said open end of said cylindrical recess with said fingers extending into said cylindrical recess and an end of said conduit is inserted through said ring, said fingers frictionally engage the outer surface of said conduit and are bent outwardly so that said locking tab at the distal end of said at least one finger engages said shoulder to inhibit withdrawal of said retaining clip from said cylindrical recess, said fingers inhibiting withdrawal of said conduit therefrom.

4,953,899

CLAMP ASSEMBLY

Frederick H. Printiss, Sr., Neillsville, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed Feb. 21, 1989, Ser. No. 312,921
Int. Cl.[5] F16L *19/02*
U.S. Cl. 285—420 **5 Claims**



5. In an exhaust system, a pair of metal tubes disposed in axial alignment with adjacent end portions of said tubes being disposed in overlapping relation, and a clamp assembly comprising a ring to receive the overlapping adjacent end portions of said tubes and having a pair of overlapping ring ends disposed in direct contact with each other, a generally U-shaped bracket for each of said ring ends, each bracket having opposed first and second legs, means for securing a first leg of each bracket to one of said ring ends and the second leg of each bracket being disposed in contact with the outer surface of the other of said ring ends whereby the other ring end can slide relative to the respective bracket, each bracket defining an opening with said openings being in alignment, a generally shaped extension connected to the first leg of each bracket and having a first section extending longitudinally of the axis of said ring and disposed in contact with the outer surface of said overlapping ring ends, said extension also having a second section extending radially inward from the outer end of said first section and disposed in contact with said other ring end whereby said other ring end can slide relative to the respective extension, and fastening means extending freely through said aligned openings for drawing said brackets in a direction toward each other to contract said ring and clamp said overlapping ends of said tubes.

4,953,900

SINGLE USE LOCK

George F. Pickett, 3453 Beechway Blvd., Toledo, Ohio 43614

Filed May 7, 1990, Ser. No. 520,021
Int. Cl.[5] B65D *55/06*
U.S. Cl. 292—307 R **11 Claims**

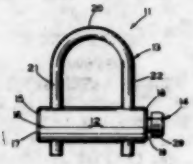
1. A locking apparatus comprising:

a generally cylindrical lock body having a pair of spaced apart radially extending lock ring apertures formed therein and a screw aperture formed in an end of said lock body and extending to an adjacent one of said lock ring apertures;

a lock ring having a curved central portion attached at opposite ends to a pair generally straight legs, said legs adapted to extend into corresponding ones of said lock ring apertures; and

a lock screw having a head attached to one end of a threaded

body, said threaded body adapted to threadably engage said screw aperture and having a cutting edge formed on an opposite end for engaging one of said legs extending into said adjacent one of said lock ring apertures, said cutting edge being formed with an internal chamfer at an



angle of approximately thirty degrees with respect to a line generally parallel to a longitudinal axis of said lock screw whereby when said legs are inserted into said apertures and said lock screw is threaded into engagement with said one leg, said lock ring is retained by said lock body.

4,953,901

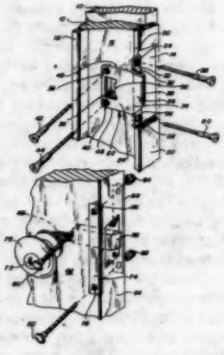
HIGH SECURITY KEEPER AND REINFORCEMENT BAR FOR ENTRY DOOR

Randy A. Hegdahl, 7521 Jersey Ave. North #205, Brooklyn Park, Minn. 55428

Filed Feb. 2, 1990, Ser. No. 473,905

Int. Cl.[5] **E05C** *1/16, 21/02*

U.S. Cl. 292—340 **4 Claims**



1. In an entry door structure having a exterior side and an interior side, and comprising a frame and a door, said door having an exterior side and an opposing interior side, a free vertical edge, and a latch member biased to project outwardly from the free vertical edge, said frame having a vertical jamb which has a vertical interior edge surface and a vertical face surface, said vertical face being substantially parallel and proximate to the free vertical edge of the door when the door is closed, a vertical stop strip fixed to said jamb toward the exterior side of said door structure for abutment stopping of swinging closure motion of said door in said frame, a vertical trim strip along the vertical interior edge surface of said jamb, and a strike plate on said jamb at a location to be struck by the latch member of said door on swinging closure of said door in said frame, said entry door structure being characterized by the following improvements for enhancing strength of latching of said door, and for thwarting unauthorized forced opening of said door from the exterior side, wherein:

said strike plate consists of a unitary metal member having a face portion which merges into a curved lip portion which merges into a lateral flange oriented perpendicularly to the face portion,

said face portion has upper and lower edges defining the vertical dimension thereof and has a recess for receiving said latch member and has spaced mounting holes through which mounting screws extend into said jamb to fix said face portion on the face surface of said jamb,

said lateral flange has upper and lower edges defining the vertical dimension thereof, said vertical dimension of said lateral flange being greater than the vertical dimension of said face portion, said lateral flange having mounting holes therethrough exclusively at locations higher and lower than the mounting holes through said face portion, and

said lateral flange being securely mounted to the interior edge surface of said jamb beneath said trim strip by screw members which extend through the mounting holes of said flange into said jamb, whereby all screws mounting said face portion of said strike plate on said jamb extend into said jamb at locations between the jamb penetration of the screws mounting said flange on said jamb so as to enhance the resistance of said strike plate from being forced out of said jamb by application of pressures on the door from the exterior side thereof.

4,953,902

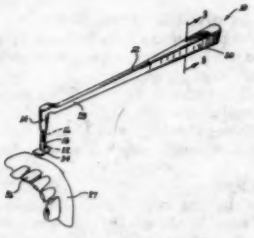
DEVICE FOR ADHESIVELY HOLDING SMALL OBJECTS

Martin A. Brown, 11604 Manitou Dr., Fountain Hills, Ariz. 85268

Filed Sep. 21, 1988, Ser. No. 247,403

Int. Cl.[5] **A61C** *3/00;* **B25J** *15/00*

U.S. Cl. 294—1.1 **6 Claims**



1. A placement holder for lifting small objects comprising, in combination:

adhesive material by which said small objects are lifted;

plunger means for releasing said adhesive material;

a hollow cylinder slidably mounted on said plunger means, said cylinder forming open-ended chamber means for containing said adhesive material; and

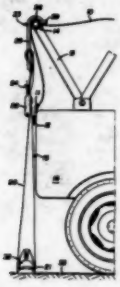
handle means fixedly coupled to said plunger means for manipulating said placement holder, said handle means having a first end portion comprising a peripheral wall cantilevered therefrom coaxially with said plunger means forming a cylindrical cavity therebetween, with said cylinder slidably mounted within said cylindrical cavity, and second end portion.

4,953,903

TOOL TO ASSIST ATTACHING FABRIC TOP TO VEHICLE BODY

David M. Warner, 2830 Palmer Dr., Hollywood, Fla. 33021

Filed Apr. 21, 1989, Ser. No. 341,411
Int. Cl.[5] B25B *25/00*; B60J *7/12*; B66F *19/00*
U.S. Cl. 294—1.1 9 Claims



1. For use with a utility vehicle resting on a support surface and having:

a back with fastener elements thereon;

a horizontal rear cross rod spaced substantially vertically above said back of the vehicle and displaceable slightly downward by a downward force on the rear cross rod;

and a flexible fabric top extending from front to back across the top of said rear cross rod and down behind said rear cross rod to said back of the vehicle, said fabric top having fastener elements at its lower end for attachment to said fastener elements on the back of the vehicle;

a tool for pulling said cross rod down slightly to facilitate the attachment of said fastener elements on the fabric top to said fastener elements on the back of the vehicle comprising:

an elongated flexible belt having upper and lower ends and having a loop at its lower end for receiving a person's foot to pull down on the belt;

and a hook member connected to the upper end of said belt and having a lower segment extending up from said belt and an arcuate hook segment joined to the upper end of said lower segment and presenting a downwardly-facing recess for engagement over said canvas top on said cross rod;

said hook member and belt having a combined length slightly less than the vertical distance of said rear cross rod on the vehicle down to said support surface so that, when the person's foot pulls the belt down to engage said loop with the support surface, the belt pulls said rear cross rod on the vehicle down a slight distance to lower said fastener elements on said fabric top toward said fastener elements on the back of the vehicle.

4,953,904

MATTRESS CARRIER

William S. Danboise, 4119 E. Beryl, Phoenix, Ariz. 85028

Filed Feb. 9, 1989, Ser. No. 308,302
Int. Cl.[5] B65G *7/12*
U.S. Cl. 294—15 5 Claims

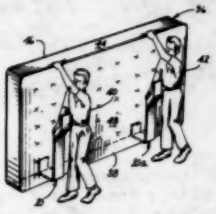
1. A mattress carrier comprising:

a unitary member, said member including

a first plate-like side opposed to a second plate-like side;

a plate-like bottom, said first and second sides and said bottom forming an open ended cradle where said bottom is connected to a proximal portion of each of said first and second sides, the interior distance between said first and second sides being at least equal to the thickness of a mattress to be carried, said first side having an outwardly curving portion between said proximal portion of said first side and a distal portion of said first side;

a pair of opposed end plates extending upwardly from said curving portion and perpendicularly to said first side; and



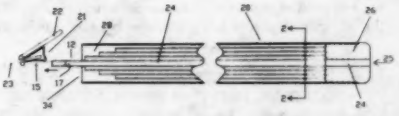
a handle connected to said end plates and positioned outwardly of the plane of said first side.

4,953,905

TELESCOPING DISPLAY DEVICE

Abraham Cohen, 642 Milton Ave., Lyndhurst, N.J. 07071

Filed May 11, 1989, Ser. No. 350,165
Int. Cl.[5] B25J *1/02*; F16B *7/10*; G09F *21/02*
U.S. Cl. 294—19.1 1 Claim



1. A telescoping device for the display of information, comprising:

(a) a plurality of annularly disposed conical segments, each of said segments having a base having an outside diameter in excess of one inside diameter of that conical segment within which it is annularly disposed;

(b) a cylindrical housing within which said plurality of conical segments, when axially telescoped within each other, may be stored;

(c) a mouthpiece having substantially the diameter of said housing and integrally secured to one base thereof, said mouthpiece having an axial channel in fluid communication with the inside diameter of an innermost of said annular substantially conical segments;

(d) clasping means secured at end of said innermost of said annular segments and in fluid-tight fit with the inside diameter of said end, said end of said innermost annular segment being opposite to that end in fluid communication with said mouthpiece,

whereby by providing a pressurized fluid input to said axial channel of said mouthpiece, said innermost annular segment will be advanced in the direction of said pressurized fluid input and after a sufficient advance of said innermost annular segment, the base of said segment will engage the interior of a corresponding opposite end of the next surrounding annular segment, thereby engaging said opposite end of said next surrounding segment to result in the successive expansion of said plurality of annular substantially conical segments, in which information may be held by said clasping means after said expression has occurred.

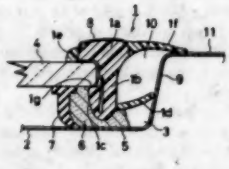
4,953,906
GOLF BALL RETRIEVER
Charles S. White, 338 Prinz, San Antonio, Tex. 78213
Filed Apr. 14, 1989, Ser. No. 337,918
Int. Cl.[5] A63B *47/02*
U.S. Cl. 294—19.2 **3 Claims**

1. A golf ball retriever comprising a single rod member having a first end being formed into a partial substantially unyielding loop which partially defines a circle, a second end being formed into club grip attachment means for attachment of said golf ball retriever to the end portion of the grip of a golf club and a linear segment which intersects said partial loop and extends from said first end toward said second end;

said partial loop originating at the intersection of said linear segment of said rod with said partial loop and terminating after extending circularly through approximately 1.3 pi radians of curvature, said partial loop being situated off-center relative to said linear segment of said rod member whereby a first imaginary line which coincides with the longitudinal axis of said linear segment of said rod member and a second imaginary line being parallel to the first imaginary line and passing through the center point of said circle are separated by a distance equal to one-fourth of the diameter of said circle;

said first imaginary line delineating a first larger portion of said circle and a second smaller portion of said circle, said second smaller portion of said circle wholly incorporating the arc of said circle left undefined by said partial loop.

4,953,907
MOLDING FOR CAR WINDOWPANE
Tooru Sugita, Okazaki, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Apr. 13, 1989, Ser. No. 337,843
Int. Cl.[5] B60J *1/02*
U.S. Cl. 296—93 **4 Claims**



1. A molding assembly for a car windowpane disposed between a windowpane mounting recess provided in an edge wall of a window opening and a corresponding edge of the windowpane to seal a gap formed therebetween, wherein said molding assembly comprises:

an adhesive connected to said edge wall;

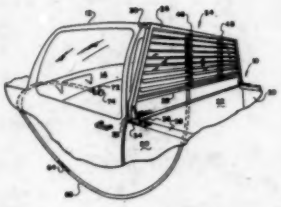
a strip upper portion bridging the gap between said windowpane and the edge wall of said window opening;

a leg portion depending from said strip upper portion and having a free end positioned in said adhesive;

a first engaging portion extending from said free end towards said windowpane and being integrally molded with said leg portion; and

a second engaging portion extending toward the edge wall of said recess and being integrally molded with said leg portion, at least opposite sides of said strip upper portion contacting the edge of sad opening window and said windowpane being made of a synthetic resin having a reduced frictional characteristic.

4,953,908
LOUVERED HEADACHE RACK
Jerry A. Dondlinger, P.O. Box 2891, Amarillo, Tex. 79105-2891
Filed Aug. 23, 1989, Ser. No. 398,826
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.4 **18 Claims**



1. On a pickup truck having

a. a bed behind

b. a cab,

c. a rear window in the cab, and

d. an instrument panel in the cab;

e. an improved adjustable louvered headache rack comprising:

f. a frame having four edge members each in the form of a tube, namely:

i. a top tube,

ii. a bottom tube, parallel to the top tube, and

iii. two side tubes,

g. said frame attached to the pick up truck, so that

h. the frame is behind the rear window, and

j. a plurality of louver slats in the frame,

k. each slat

i. parallel to the top and bottom tubes, and

ii. journaled to the side tubes by

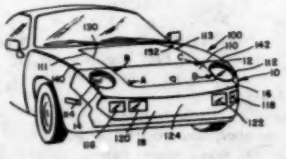
iii. a pin at each end of each slat,

l. an operating bar extending from about the top tube to about the bottom tube, and

m. a finger rigidly attached to each of said slats,

n. each finger journaled to said operating bar.

4,953,909
VEHICLE HOOD PROTECTOR WITH SPECIALIZED ATTACHING APPARATUS
Timothy N. F. Crane, 1140 N. Clark, Suite 209, West Hollywood, Calif. 90069
Filed Dec. 14, 1989, Ser. No. 450,735
Int. Cl.[5] B62D *25/00*
U.S. Cl. 296—136 **8 Claims**



1. A vehicle hood protector in which the vehicle has at least a vehicle hood, two front fenders on either side of the vehicle hood, the hood being defined by two side edges adjacent a respective front fender and a hood channel between an edge of

the vehicle hood and its adjacent fender, the vehicle hood protector, comprising:

a. a one piece hood shield which is sized to conform to the shape of the front portion of the vehicle hood and front fenders of the vehicle when laid over the vehicle hood and front fenders;

b. four retaining blocks, with a respective one retaining block spaced at the two front corners of the vehicle hood and adjacent a respective side edge of the vehicle hood and at the rear intersections of the hood shield and rearmost areas of the portion of the vehicle hood adjacent its sides edges over which the hood shield lays;

c. each retaining block having a top surface, a bottom surface, transverse ends, and further comprising,

(i) at least one suction member on its lower surface which serves to retain the retaining block on the vehicle hood,

(ii) an interior longitudinal slot extending for most of the length of the retaining block and opening out the transverse end of the retaining block adjacent the side edge of the vehicle hood proximate the location of the retaining block,

(iii) at least one transverse shaft extending through most of the thickness of the retaining block and opening out of the top surface of the retaining block, the transverse shaft intersecting a portion of the longitudinal interior slot;

d. a mating retaining block attaching member for each retaining block, further comprising,

(i) an upper elongated section sized to fit into the interior longitudinal slot of a retaining block and having at least one transverse opening located to be in alignment with the at least one transverse shaft of a retaining block when the upper elongated section is inserted into the interior longitudinal slot of the retaining block,

(ii) a lower section having a grooved endpiece defining a channel which is dimensioned to accommodate a portion of a side edge of the vehicle hood,

(iii) a vertical section joining the upper elongated section and the lower section and sized to permit the upper elongated section to fit into the longitudinal slot of a retaining block while simultaneously permitting the channel in the grooved endpiece of the lower section to receive a portion of a side edge of the vehicle hood, a portion of the vertical section resting within a hood channel;

e. said one piece hood shield having a least one transverse opening at each of four locations where the retaining block and retaining block attaching member assemblies are positioned, with said at least one transverse opening at each location aligned with the opening of the transverse shaft and the opening in the longitudinal upper section of the retaining block attaching means; and

f. a securing means for each retaining block and retaining block attaching means extending through the at least one transverse opening in the one piece hood shield, through the opening of the transverse shaft in the retaining block and through the at least one opening in the longitudinal upper section of the retaining block attaching means at each of the four locations to thereby join the one piece hood shield, the retaining block and the retaining block attaching member together at each of the four locations.

4,953,910

OPENABLE ROOF CONTROL DEVICE OF WHEELED MOTOR VEHICLE

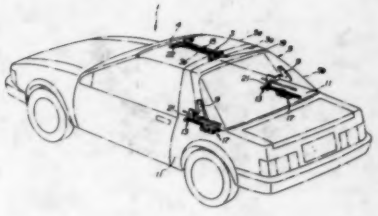
Junichi Maekawa, Yokohama; Masanori Abe, Ayse; Hirofumi Ienaga, Kawasaki, and Shigeaki Hashimoto, Chigasaki, all of Japan, assignors to Nissan Motor Co., Ltd. and Ohi Seisakusho Co., Ltd., both of, Japan

Filed Oct. 18, 1988, Ser. No. 260,127

Claims priority, application Japan, Oct. 19, 1987, 62-261735; Oct. 19, 1987, 62-261736; Oct. 19, 1987, 62-158815

Int. Cl.[5] B60J *7/057*

U.S. Cl. 296—223 **20 Claims**



1. In a wheeled motor vehicle having a slidably openable roof on a roof construction, an openable roof control device for controlling operation of said openable roof, which comprises:

three slide mechanisms arranged on mutually spaced portions of the body of said vehicle, one of said three-slide mechanisms being mounted on said roof construction and the other two of said three slide mechanisms being respectively mounted to laterally opposed sides of the vehicle body, each slide mechanism including a carrier device which carries thereon said openable roof for moving said openable roof between a full closed position and a full open position;

three electric actuators which are respectively connected to said three slide mechanisms for moving, when electrically energized, the carrier devices between positions corresponding to said full closed position of the openable roof and the other positions corresponding to said full open position of the openable roof;

latch means for latching at least two of said carrier devices relative to the vehicle body when said openable roof comes to one of said full closed and full open positions; and

control means for controlling operation of said three electric actuators.

4,953,911

CONVERTIBLE SEAT FOR MOTORCYCLE

Michael W. Hanagan, San Jose, Calif., assignor to Corbin Pacific, Watsonville, Calif.

Filed Nov. 23, 1988, Ser. No. 275,421

Int. Cl.[5] B62J *1/00*

U.S. Cl. 297—195 **8 Claims**

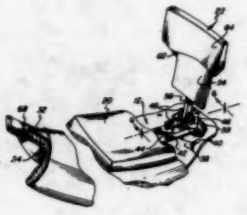
1. A unitary tandem motorcycle seat for attachment to the frame of a motorcycle comprising a unitized assembly of:

(a) a unitary rigid, elongated platform member having side margins and configured to seat upon and be secured to the frame of the associated motorcycle for firm support thereby, said platform member having mounting means on its lower surface and spaced inwardly of the side margins thereof for engagement to the frame and adapted to be substantially concealed when the seat is mounted on the motorcycle;

(b) an elongated tandem saddle on said platform member providing a driver seat portion at its front end and a passenger seat portion at its rear end, said saddle having side margins;

(c) a backrest for a person seated on said passenger seat and having a depending arm spaced inwardly from the side margins of said saddle, said backrest having side margins;

(d) support means on said platform member pivotably mounting said backrest arm to said platform member adjacent the rear end of said saddle, said support means being spaced inwardly from the side margins of said backrest and saddle and being disposed below an adjacent upper surface of said saddle, whereby said backrest is movable between a substantially horizontal passenger seat covering position and an erected backrest position, said



support means and a portion of said arm of said backrest being disposed below an upper surface of said backrest and saddle so as to be substantially concealed upon pivoting of said backrest into its seat covering position; and

(e) cooperating releasable locking means on said support means and said backrest, said locking means being spaced inwardly from the side margins of said backrest and saddle for locking said backrest to said platform member in said seat covering position, said mounting means, said support means and a portion of said depending arm all being spaced below said backrest and saddle so as to be concealed when said backrest is in said seat covering position.

4,953,912

STRUCTURE OF A BLIND PANEL WINDOW FOR AN AUTOMOBILE

Masahiro Munemura, and Kenji Takahashi, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1989, Ser. No. 385,822
Claims priority, application Japan, Aug. 5, 1988, 63-103874
Int. Cl.[5] B60R *27/00*
U.S. Cl. 296—191 **6 Claims**

1. In a structure of a blind panel window for an automobile, in which the blind panel is attached by an adhesive to a circumferential flange portion of a window frame panel of the automobile in position to externally cover a window frame panel opening defined by the circumferential flange portion, the blind panel having a peripheral portion, the improvement which comprises:

an inner frame mounted internally to the window frame panel for covering the circumferential flange portion, the inner frame including supporting means for supporting the blind panel at a predetermined interval from the circumferential flange portion of the window frame panel; and

adhesive portion defining means for defining a portion receiving the adhesive,

first circumferential resilient damming means for damming an outward flow of the adhesive between the inner frame and the circumferential flange portion while curing the adhesive, the first circumferential damming means bridging between the inner frame and the circumferential flange portion and extending along the circumferential flange portion,

second circumferential resilient damming means for damming an outward flow of the adhesive between the inner frame and the blind panel until setting of the adhesive, the second circumferential damming means bridging between the inner frame and the blind panel and extending to internally surround the circumferential flange portion of the window frame panel, and

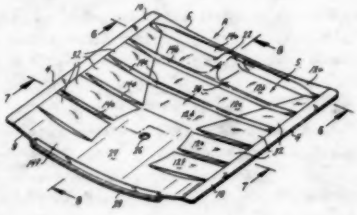
third circumferential resilient damming means for damming an outward flow of the adhesive between the blind panel and the circumferential flange portion of the window frame panel while curing the adhesive, the third circumferential damming means being attached to the peripheral portion of the blind panel so as to extend along the peripheral portion.

4,953,913

CONTOURED SEAT BASE

Robert H. Graebe, 4 Signal Hill Blvd., Belleville, Ill. 62223

Filed Nov. 3, 1988, Ser. No. 266,867
Int. Cl.[5] A47C *7/16, 7/62*
U.S. Cl. 297—459 **20 Claims**



1. A seat base formed from a substantially rigid material of generally uniform thickness, said seat base having spaced apart sides and a plurality of spaced apart ribs which extend transversely toward the sides and project downwardly, the ribs being generally hollow and creating upwardly opening grooves, the seat base also having panels located between the grooves with the panels being generally wider than the ribs, the upwardly presented surfaces of the panels establishing an upper effective contour which is suited for seating purposes, in that it is at least in part slightly concave, and the downwardly presented surfaces of the ribs establishing a lower effective contour which is substantially different from the upper effective contour in that the spacing between the downwardly presented surfaces of at least some of the ribs and the panels adjacent to those ribs varies along the lengths of the ribs, so that none of those ribs possesses a uniform height, the lower effective contour being generally uniform to conform to an underlying supporting surface of generally uniform shape.

4,953,914
MINING MACHINE WITH ROOF BOLTING APPARATUS

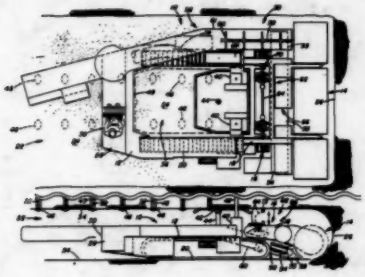
Maurice K. LeBegue, Fairmont, W. Va., assignor to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 212,337, Jun. 27, 1988, abandoned, which is a continuation of Ser. No. 9,278, Jan. 30, 1987, Pat. No. 4,753,486, and a continuation-in-part of Ser. No. 759,329, Jul. 26, 1985, abandoned. This application Mar. 28, 1989, Ser. No. 329,592

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[5] E21D *20/00*

U.S. Cl. 299—11 15 Claims



1. A mining machine for dislodging material from a vertical face comprising:

a frame;

roof bolting means movably mounted within said frame;

dislodging means mounted on one end of said frame;

propelling means for propelling said machine within a mine along the floor of said mine to advance said dislodging means into a face of said mine to dislodge material therefrom while actuating said roof bolting means to install roof bolts in the mine roof;

said roof bolting means arranged to remain in a stationary position and install roof bolts in the mine roof while said mining machine advances and dislodges material from the face;

transverse conveyor means mounted on said frame rearwardly of and below said dislodging means for gathering said material dislodged thereby; and

longitudinal conveyor means mounted on said frame and extending from said transverse conveyor means rearwardly of said machine to receive said material from said transverse conveyor means and to transport said material to a location rearwardly of said machine.

12. A method of dislodging material from a vertical face comprising the steps of:

providing a mining machine having dislodging means mounted on one end thereof and a frame member, said frame member having a pair of spaced longitudinal side members;

propelling said mining machine within a mine along a floor of said mine to advance said dislodging means into a face of said mine to dislodge material therefrom; and

maintaining a roof bolt means in fixed position and installing roof bolts in the roof of said mine above said mining machine at locations between said frame member longitudinal side members when said dislodging means of said mining machine is located at said face of said mine.

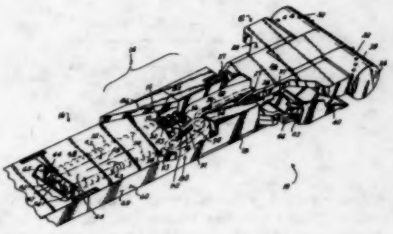
4,953,915
ROOF FALL SEPARATING AND REMOVING APPARATUS AND METHOD FOR USE IN THIN SEAM HIGHWALL MINING

Manfred Jasser, Versailles, and Thomas Lipinski, Winchester, both of Ky., assignors to Metec, Inc., Lexington, Ky.

Filed Jul. 31, 1989, Ser. No. 387,621

Int. Cl.[5] E21C *35/20*

U.S. Cl. 299—18 31 Claims



11. A mining machine comprising:

a cutter head operable to mine material from a mined seam by cutting a hole while advancing forwardly into the seam;

a conveyor assembly connected at its forward end to said cutter head, said assembly comprising a box-like column having a conveyor housed therein, said conveyor being operable to convey therethrough material which has been directed into said conveyor;

means carried by said cutter head for directing material mined by said cutter head into said conveyor when said cutter head is advancing forwardly into the seam;

a partition on the upper side of said box-like column for supporting material fallen from the roof of the mined hole and maintaining the fallen rock separate from mined material being conveyed by said conveyor when the cutter head is advancing into the seam; and

means carried by said conveyor assembly for directing fallen roof material supported by said partition into said conveyor when said assembly and said cutter head are being withdrawn from the mined hole.

26. A method of mining coal from a seam at a highwall comprising the steps of:

advancing a cutting head forwardly into the seam by exerting compressive force against the rear of the cutting head through a pushbeam from the highwall such that the pushbeam follows the cutting head forwardly into the seam;

conveying mined coal through a conveyor housed within said pushbeam while the cutting head is being advanced;

supporting above the pushbeam roof rock which falls upon the pushbeam, and maintaining the fallen rock separate from the conveyed coal as the cutting head is being advanced;

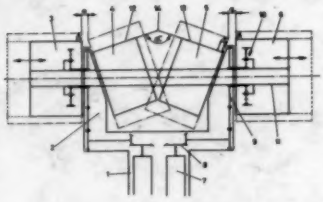
withdrawing the cutting head and pushbeam from the coal seam by pulling the pushbeam rearwardly at the highwall to draw the pushbeam followed by the cutting head rearwardly from the seam;

directing the separated fallen rock supported upon the pushbeam into the conveyor and conveying the fallen rock through the conveyor as the pushbeam and cutter head are being withdrawn from the seam.

4,953,916
DRIVE ARRANGEMENT FOR DRIVING CUTTING ROLLS

Erich Brandl, Grosslobming, Austria, assignor to Voest-Alpine Maschinenbau Gesellschaft M.B.H., Linz, Austria

Filed Nov. 9, 1988, Ser. No. 268,771
Claims priority, application Austria, Nov. 11, 1987, 2982/87
Int. Cl.[5] E21C *25/08*
U.S. Cl. 299—76 **9 Claims**



1. A rotary cutting roll arrangement for a machine for cutting material from a drift face having a width, comprising:

a straight drive shaft arranged to be supported for rotation about its own longitudinal axis with said axis extending widthwise of the drift face;

a cutting roll means having a radially outer periphery provided with a plurality of axially and angularly spaced cutting bits; said cutting roll means being divided into a plurality of cutting roll portions juxtaposed end to end in a series and mounted by respective mounting means on said drive shaft for rotation therewith; said cutting roll portions including at least two laterally outer portions respectively flanking two more medial portions;

said mounting means for said laterally outer cutting roll portions mounting said laterally outer cutting roll portions coaxially with one another and with said drive shaft; and

said mounting means for said two more medial cutting roll portions being constituted by respective universal joint means which mount respective ones of said two more medial cutting roll portions on said drive shaft;

said two more medial cutting roll portions having respective one ends disposed proximally of one another, and respective other ends disposed distally of one another, said universal joint means being so located relative to said one ends as to predispose said two more medial cutting roll portions to remain disposed in use with their longitudinal axes at an obtuse angle to one another.

4,953,917
STEERING-BRAKE SYSTEM

Kurt Wittich, Flörsbachtal, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,114
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1988, 3801228
Int. Cl.[5] B60T *11/24, 15/36;* B62D *11/08*
U.S. Cl. 303—961 **15 Claims**

1. Fluid-operated steering brake system for selectively operating one or both of two wheel brake cylinders located on opposite sides of a vehicle, comprising:

a high pressure fluid source,

a low pressure fluid region,

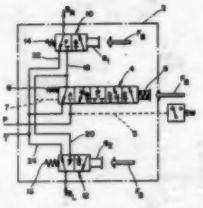
a steering-brake unit comprising:

a brake-valve device interposed between said pressure source and said wheel brake cylinders, and

first and second reversing valves each interposed between said brake-valve device and a respective one of said wheel brake cylinders for conducting pressurized fluid from said brake valve device to said respective wheel brake cylinder, each of said reversing valves being movable against a restoring force independent of pressurized braking fluid from a first position communicating said respective wheel brake cylinder with said low pressure region to a second position communicating said respective wheel brake cylinder with high pressure fluid received from said brake-valve device, each of said reversing valves comprising:

a housing forming a brake-line port communicating with a respective wheel brake cylinder, and a brake pressure port communicating with said brake-valve device for receiving pressurized fluid therefrom,

a movable valve body including spaced lands defining channel means which communicate said brake-line port selectively with said brake pressure port and said low pressure region, one of said lands being configured to overlie said brake pressure port in said first position of said reversing valve to block said brake pressure port from both said brake line port and said low pressure region,



means defining said restoring force for biasing said movable valve body to said first position wherein said one land blocks said brake pressure port from both said brake line port and said low pressure region, and

actuating pedal means comprising half-pedals each associated with said brake valve device and a respective one of said reversing valves, whereby depression of one half-pedal actuates said brake valve device and a respective reversing valve, and depression of both half-pedals actuates said brake valve device and both of said reversing valves, either of two depressed half-pedals being releasable while the other half-pedal remains depressed, whereupon said one land associated with said released half-pedal is moved to said position blocking said brake pressure port from both said brake line port and said low pressure region so that the braking pressure associated with the still depressed half-pedal is not influenced in any way whatsoever.

4,953,918
MODULATOR FOR USE IN AN ANTI-LOCK BRAKE CONTROL SYSTEM

Koichi Hashida, and Teruhisa Kohno, both of Itami, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Sep. 1, 1989, Ser. No. 401,845
Claims priority, application Japan, Sep. 3, 1988, 63-116187[U]
Int. Cl.[5] B60T *8/46*
U.S. Cl. 303—115 **2 Claims**

1. In an anti-lock brake control system for an automobile vehicle, which system including:

a master cylinder;

a main fluid passage means communicating between the master cylinder and at least one wheel brake;

a recirculating passage means branched off from the main fluid passage means for recirculating a fluid medium from the main fluid passage means back to an upstream portion of the main fluid passage means with respect to the direction of flow towards the wheel brake;

an electric motor having an eccentric drive shaft;

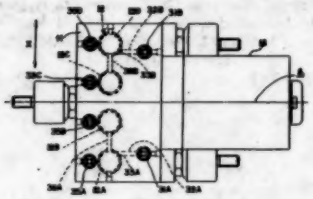
a motor-driven plunger pump means disposed on the recir-

culating passage means and having a longitudinal axis lying perpendicular to the eccentric drive shaft;

a normally closed, solenoid-operated discharge valve means having a longitudinal axis and disposed on a portion of the recirculating passage means between that portion of the main fluid passage means, at which the recirculating passage means is branched off from the main fluid passage means, and the plunger pump means, said discharge valve means being adapted to control the flow of the fluid medium therethrough;

a flow control valve means having a longitudinal axis and including at least one inlet port communicated with the master cylinder through the main fluid passage means, a plurality of first outlet ports communicated with the wheel brake, a second outlet port communicated with the recirculating passage means, a spool having an orifice defined therein and supported for movement between inoperative and operative positions for controlling the communication between the inlet port and one of the first and second outlet ports, and a biasing spring means for biasing the spool to the inoperative position;

said spool being held at the inoperative position in the event of occurrence of a lockup condition to allow a large amount of fluid medium to flow from the inlet port towards the first outlet ports;



said discharge valve means being electrically energized, when a pressure applied to the wheel brake is reduced during the occurrence of the lockup condition, to open thereby to cause the spool to move against the biasing spring to establish a fluid discharge circuit between the first and second outlet ports, but said discharge valve means being deenergized, when the pressure applied to the wheel brake is increased during the occurrence of an anti-lock condition, to close thereby to establish a restricted fluid circuit leading from the inlet port to the second outlet port through the orifice;

said spool being moved back to the inoperative position as biased by the biasing spring when the difference in pressure between the inlet port and the first outlet ports becomes small;

the improvement comprising:

an anti-lock modulator provided with a single housing structure accommodating the flow control valve means and the discharge valve means in line with and in series-connected fashion with each other, both said flow control valve means and said discharge valve means and said electric motor being disposed on respective sides of the longitudinal axis of the plunger pump means, all of the longitudinal axes of each of the flow control valve means and the discharge valve means, the longitudinal axis of the plunger pump means and the longitudinal axis of the eccentric drive shaft being laid perpendicular to one another.

4,953,919

TRACK SUSPENSION SYSTEM

Frederic E. Langford, Redmond, Wash., assignor to Phoenix Engineering, Inc., Redmond, Wash.

Filed Feb. 15, 1989, Ser. No. 311,153
Int. Cl.[5] B62D *55/30*
U.S. Cl. 305—31 **9 Claims**

1. A triangular track suspension system for a vehicle comprising:

a pivot shaft affixed to said vehicle,

a drive sprocket mounted on said vehicle and positioned adjacent and above said pivot shaft;

a track frame having first and second ends, said track frame being mounted for rocking movement on said pivot at a location between said first and second ends,

an idler wheel link pivotally attached to the first end of the track frame and extending upwardly therefrom and terminating in an upward end,

a first idler wheel mounted for rotation on the upper end of said idler wheel link,

a second idler wheel and means mounting said second idler wheel for rotation on the second end of said track frame,

a continuous track engaging said drive sprocket, said first idler wheel, and said second idler wheel, and

take-up means mechanically linking said idler wheel and link and said vehicle for moving the upper end of said idler wheel link away from said pivot shaft in direct reaction to the rocking motion of said track frame away from the horizontal so as to move said first idler wheel away from said pivot shaft and thereby maintain substantially constant circumference around the idler wheels and drive sprocket.

4,953,920

REVOLVING, INEXTENSIBLE BAND, PARTICULARLY A TRACK FOR VEHICLES

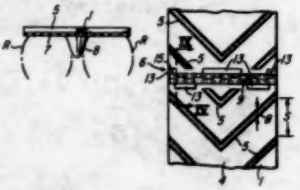
Andreas Jäger, Burgdorf, Fed. Rep. of Germany, assignor to Arnold Jäger, Burgdorf, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,711
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1987, 3738324; Jul. 14, 1988, 3823875
Int. Cl.[5] B62D *55/18*
U.S. Cl. 305—35 EB **23 Claims**

1. A revolving, inextensible, flexible band, especially a track for vehicles, that is made endless via connecting means disposed in a zone of connection, with the outer surface of the band body being provided with ribs including first projections distributed with regularity in a uniform distribution over the length of the band in a spacing as to each other greater by a multiple than width thereof, and with said connecting means being disposed between ones of said ribs, said band further comprising:

additional second projections that are disposed non-uniformly distributed on said outer surface of said band body and concentrated particularly in the region of said zone of connection, with said additional second projections projecting from said outer surface of said band body

at least as far as do said connecting means, and with said additional second projections, said ribs, and said band body all at least essentially comprising rubber or rubber-like material, said first and second projections precluding wear effects and premature damage, especially abrasion, relative to said connecting means.



4,953,921

GROUND ENGAGING SURFACE FOR ENDLESS TRACKS, WHEELS AND TIRES

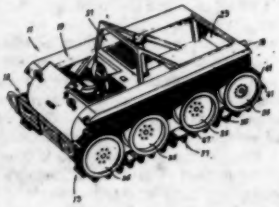
Alan R. Burns, Mosman Park, Australia, assignor to Altrack Limited, Australia

PCT No. PCT/AU86/00318, § 371 Date Aug. 20, 1987, § 102(e) Date Aug. 20, 1987, PCT Pub. No. WO87/02953, PCT Pub. Date May 21, 1987

PCT Filed Oct. 21, 1986, Ser. No. 105,382

Int. Cl.[5] B62D *55/24*

U.S. Cl. 305—35 EB **17 Claims**



1. An endless track for tracked vehicles comprising an endless flexible band having an inner surface and an outer surface, and a plurality of elongated tread elements provided in a spaced relationship on said outer surface of said band and extending transversely with respect to the direction of motion of said track, each of said track elements being of resiliently deformable construction and being hollow, defining a cavity, said cavity being unpressurized and open to ambient atmospheric pressure.

4,953,922

WEB MATERIAL FOR CAMOUFLAGE AGAINST ELECTROMAGNETIC RADIATION

Claes Göran Granqvist, Mölndal, Sweden, assignor to HB Radicool Research & Development, Sweden

PCT No. PCT/SE87/00367, § 371 Date Feb. 7, 1989, § 102(e) Date Feb. 7, 1989, PCT Pub. No. WO88/01363, PCT Pub. Date Feb. 25, 1988

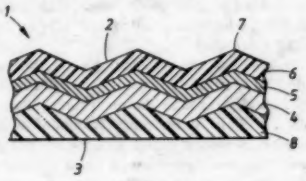
PCT Filed Aug. 21, 1987, Ser. No. 314,764

Claims priority, application Sweden, Aug. 21, 1986, 8603522

Int. Cl.[5] F41H *3/00*; G02B *5/22, 5/26, 5/28*

U.S. Cl. 350—1.7 **6 Claims**

1. Web material for camouflaging against electromagnetic radiation, and having a front side, which is intended to face a potential observer or detector, as well as a backside, which is intended to face an object, which is to be camouflaged, the material comprising several layers, a first layer of a metal foil with a first reflective surface facing the front side and with a second reflective surface facing the backside; a second layer covering the first surface of the first layer and chosen to be of a material which is absorbent for visible light and near-infrared radiation as well as transparent for thermal infrared radiation;



and on the second layer, a third layer, an outer surface of which forms said front side, the third layer being a plastic layer, provided to have a precisely determined thickness to perform an adapted absorption of radiation in the region 8–13 μm by means of interference, the outer surface forming the front side being textured in an embossed pattern having closely spaced grooves.

4,953,923

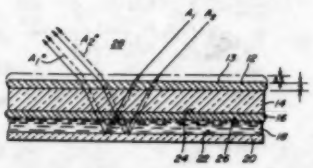
SYSTEM FOR REDUCING NOISE HOLOGRAMS

John E. Wreede, Monrovia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 1, 1988, Ser. No. 226,593

Int. Cl.[5] G03H *1/04*

U.S. Cl. 350—3.61 **20 Claims**



1. A system for recording a hologram with an exposure beam, comprising:

a substrate transparent to said exposure beam;

a recording medium positioned on said substrate;

an absorbent member means having a thickness and being positioned relative to said exposure beam and fixed on a surface of said substrate for absorbing and releasing fluid respectively from and to a surrounding environment and for varying said thickness in response to a change in fluid content thereof during an exposure time of said recording medium.

4,953,924

ENHANCED NONDESTRUCTIVE HOLOGRAPHIC RECONSTRUCTION

Redfield Stephen R., Austin, Tex., and Lambertus Hesselink, Woodside, Calif., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Dec. 30, 1987, Ser. No. 139,319

Int. Cl.[5] G02F *1/01*; G03H *1/04*

U.S. Cl. 350—3.64 **17 Claims**

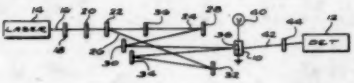
1. A recording/reconstruction cycle for a hologram in photorefractive media, comprising:

forming an interference pattern with light having a selected polarization state;

exposing photorefractive recording media to said interfer-

ence pattern to produce a diffusion field and record a hologram therein;

applying a first electric field to said recording media during said recording, said first electric field, said recording media, and said interference pattern being selected to produce drift dominated recording and values of said first electric field and diffusion field smaller than the saturation field for said recording media;



terminating said recording when the cummulative recording energy exceeds a value which produces an initial peak reconstruction efficiency; and

illuminating said recorded hologram with light having a selected polarization state relative to the polarization state of said light used to form said interference pattern to generate reconstructed light from said hologram.

4,953,925

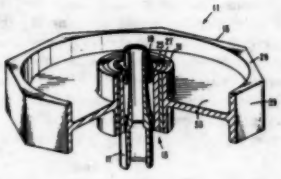
SCANWHEEL ASSEMBLY WITH STRAIN RELIEVED HUB

Merle D. Parker, Oceanside, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 21, 1989, Ser. No. 383,826

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.1 **8 Claims**



1. A bearing mounted scanwheel assembly comprising in combination:

(a) a bearing assembly having an inner member and an outer member mounted for rotation about said inner member, said outer member having a cylindrical outer surface;

(b) a scanwheel having a hub with a cylindrical inner surface, said scanwheel being mounted by its hub upon said outer member; and

(c) a circumferential strain relief channel in one of said surfaces.

4,953,926

SCANNING OPTICAL SYSTEM FOR USE IN A LASER BEAM PRINTER

Akira Morimoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 322,030

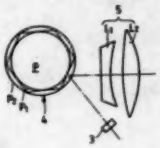
Claims priority, application Japan, Mar. 14, 1988, 63-59821; Jan. 19, 1989, 1-10633

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.8 **14 Claims**

1. A scanning optical system for use in a laser beam printer that comprises a cylindrical lens for imaging laser light in an auxiliary scanning cross section at a point in front of a deflector and an anamorphic scanning lens unit which converges light rays deflected by the deflector at a point on a scanning surface, said scanning lens unit having, in order from the deflector side, a first lens which is a negative lens element having a concave toric surface with a stronger curvature in the auxiliary scanning cross section and a second lens having a convex toric surface with a stronger curvature in the auxiliary scanning cross section, said optical system further satisfying the following condition:

$$0.015f<l<0.160f$$



where f is the focal length of the scanning lens unit in a main scanning cross section, and l is the distance between a position at which laser light is imaged with the cylindrical lens and the point at which the laser light is deflected with the deflector.

4,953,927

LENS ASSEMBLY FOR LONG-LIFE LASER IMAGING SYSTEM

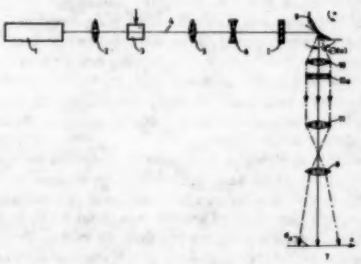
Hans J. Vedder, Puchheim, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 2, 1988, Ser. No. 279,570

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3742837

Int. Cl.[5] G02B *26/10, 3/06*

U.S. Cl. 350—6.8 **2 Claims**



1. A system for imaging a line, the system comprising:

means including a laser for emitting a modulated laser-light beam;

an image-receiving surface;

means including a deflecting element between the laser and the surface for deflecting the beam in an x-direction of the line to be imaged onto the surface;

a lens assembly including a cylinder lens between the laser and the deflecting element for focussing the beam on the deflecting element; and

a telescopic lens system between the deflecting element and the surface and including an upstream lens spaced by its focal length downstream from the deflecting element and a downstream lens focussed downstream;

a middle lens between the upstream and downstream lenses, constituted as a simple cylinder lens, and having a refractive power perpendicular to the x-direction, and

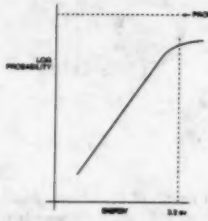
a projecting lens between the downstream lens and the image surface receiving the beam from the downstream lens and focussing it on the surface.

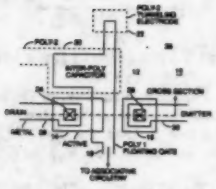
4,953,928

MOS DEVICE FOR LONG-TERM LEARNING

Janeen D. W. Anderson, Fremont, and Carver A. Mead, Pasadena, both of Calif., assignors to Synaptics Inc., San Jose, Calif.

Filed Jun. 9, 1989, Ser. No. 363,678
Int. Cl.[5] H01L 29/78, 27/02; G11C 11/34
U.S. Cl. 357—23.5 12 Claims





1. A semiconductor structure for long term learning including:

a p-type region in a semiconductor substrate,

a first n-type region disposed in said p-type region,

a floating gate disposed above said p-type region, said floating gate at least partially overlapping one edge of said first n-type region and separated from the surface of said substrate by a gate oxide under a portion of said floating gate including at least where it partially overlaps the edge of said first n-type region,

means for applying a first positive potential to said first n-type region with respect to said p-type region to reverse bias said first n-type region, said first positive potential having a magnitude of greater than about 3.2 volts relative to said p-type region, but less than the voltage required to induce avalanche breakdown in the junction between said first n-type region and said p-type region,

means for capacitively coupling a second positive potential to said floating gate, said second positive potential having a magnitude of greater than about 3.2 volts relative to said p-type region,

a second n-type region in contact with said p-type region,

means for applying a negative potential to said second n-type region with respect to said p-type region to forward bias said second n-type region, and to thereby inject minority electrons into said p-type region,

an insulating layer over said floating gate,

a conductive region disposed over said insulating layer and capacitively coupled to said floating gate,

means for selectively applying a third positive potential to said conductive region with respect to said floating gate,

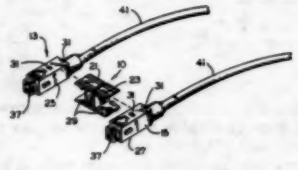
whereby said first and second positive potentials act to accelerate said minority electrons to an energy sufficient to surmount the barrier energy of said gate oxide and thereby inject said minority electrons onto said floating gate and whereby said third positive potential causes electrons to tunnel from said floating gate to said conductive region.

4,953,929

FIBER OPTIC CONNECTOR ASSEMBLY AND ADAPTER FOR USE THEREWITH

Joseph F. Basista, Owego; Wai M. Ma, and John J. Squires, both of Endicott, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Jul. 21, 1989, Ser. No. 382,925
Int. Cl.[5] G02B 6/38
U.S. Cl. 350—96.2 23 Claims



11. A fiber optic connector assembly comprising:

a connector housing defining a pair of chambers therein;

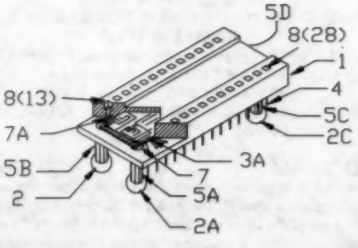
at least two, individual fiber optic connectors of the push-pull variety, each being positioned within a respective one of said chambers of said connector housing; and an adapter for holding said fiber optic connectors in a predetermined manner of alignment prior to said positioning thereof within said connector housing, said adapter including first and second clamp members, each of said clamp members adapted for clamping onto a respective one of said fiber optic connectors to hold said fiber optic connectors in a substantially side-be-side relationship, and resilient means interconnecting said first and second clamp members and oriented substantially therebetween for enabling said clamp members to move in at least four different orientations relative to each other while holding said connectors in said substantially side-by side relationship to provide adjustable alignment between said clamp members prior to said positioning of said connectors within said connector housing, thereby facilitating said alignment.

4,953,930

CPU SOCKET SUPPORTING SOCKET-TO-SOCKET OPTICAL COMMUNICATIONS

Bernard Ramsey, Springfield; Dean A. Christy, Manassas, both of Va.; Richard S. Beverly, Bowie, Md., and Jerome M. Wucher, Fairfax, Va., assignors to Ramtech, Inc., Springfield, Va.

Filed Mar. 15, 1989, Ser. No. 327,708
Int. Cl.[5] G02B 6/12
U.S. Cl. 350—96.11 21 Claims



20. A data system comprising:

(a) a first intelligent socket for detachably receiving, supporting and electrically interfacing with a first integrated

circuit device having plural electrically conductive pin connections, said first intelligent socket including:

a first socket body supporting said first integrated circuit device,

a first set of conductive electrical signal connectors disposed on said socket body for electrically coupling with the electrically conductive pins of said first integrated circuit device, and

first active circuit means, disposed within said first socket body and operatively connected to said first set of electrical connectors, for communicating electrical signals with said first integrated circuit device in a first signalling protocol particular to said first integrated circuit device;

(b) a second intelligent socket for detachably receiving, supporting and interfacing with a second integrated circuit device having electrically conductive pin connections, said second intelligent socket including:

a second socket body supporting said second integrated circuit device;

a second set of conductive electrical signal connectors disposed on said second socket body for electrically coupling with the electrically conductive pins of said second integrated circuit device, and

second active circuit means, disposed within said second socket body and operatively connected to said second set of electrical connectors, for communicating electrical signals to and from said second integrated circuit device in a second electrical signalling protocol different from said first signalling protocol, said second protocol being particular to said second integrated circuit device; and

(c) optical communication means, coupled between said first socket body and said second socket body, for communicating optical signals between said first and second active circuit means, said optical signals having a generic optical data signalling protocol different from said first and second electrical signalling protocols;

wherein said first active circuit means within said first socket body includes first protocol conversion means for generating electrical signals in said first electrical signalling protocol in response to said optical data signalling protocol signals communicated by said optical communications means, and said second active circuit means within said second socket body includes second protocol conversion means for generating signals in said second electrical signalling protocol in response to said generic optical data signalling protocol signals communicated by said optical communications means.

4,953,931

SECOND HARMONIC WAVE GENERATING DEVICE

Yasumitsu Miyazaki, Aichi; Ryo Enomoto, and Masaya Yamada, both of Gifu, all of Japan, assignors to Ibiden Co., Ltd., Gifu-Ken, Japan

Filed Dec. 19, 1989, Ser. No. 452,505

Claims priority, application Japan, Mar. 30, 1989, 64-76853; Apr. 7, 1989, 64-86885; Nov. 16, 1989, 64-298599

Int. Cl.[5] G02B 6/10

U.S. Cl. 350—96.12 **7 Claims**

1. A second harmonic wave generating device comprising a $LiNbO_3$ thin film waveguide layer formed on a $LiTaO_3$ substrate, characterized in that said $LiTaO_3$ substrate has an ordinary refractive index (n_{oS1}) of 2.10 to 2.20 at a fundamental wavelength ($\lambda\mu m$) and an extraordinary refractive index (n_{eS2}) of 2.22 to 2.28 at a second harmonic wavelength ($\lambda\mu m/2$), and an ordinary refractive index (n_{oF1}) at said fundamental wavelength ($\lambda\mu m$) of said $LiNbO_3$ thin film waveguide layer, an extraordinary refractive index (n_{eS2}) at said second harmonic wavelength ($\lambda\mu m/2$) of said $LiTaO_3$ substrate, and an extraordinary refractive index (n_{eF2}) at said second harmonic wavelength ($\lambda\mu m/2$) of said $LiNbO_3$ thin film waveguide layer have a relation

$$2.0 \leqq \frac{(n_{oF1} - n_{eS2})}{(n_{eF2} - n_{eS2})} \leqq 30.0.$$

4,953,932

OPTICAL SLIP RING

Alexander Mihich, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 25, 1989, Ser. No. 343,754

Int. Cl.[5] G02B 6/26

U.S. Cl. 350—96.15 **17 Claims**

1. An optical slip ring comprising:

first supporting means for supporting a first plurality of optical fibers in a predetermined pattern, said first supporting means having a radial axis; and

second supporting means, disposed along said radial axis, for supporting a second plurality of optical fibers in said predetermined pattern for optically communicating with said first plurality of optical fibers, said second supporting means comprising a flexible coupling joint for minimizing alignment variations between said first and second supporting means, and wherein each of said first and second plurality of optical fibers being arranged to function as a transmitting and a receiving light conductor for communicating with a light generator and a light detector.

4,953,933

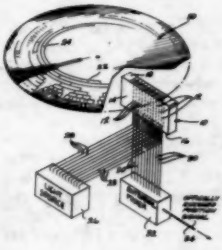
OPTICAL ENCODER READING DEVICE

Romeal F. Asmar, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 10, 1989, Ser. No. 377,723

Int. Cl.[5] G02B 6.26, 6.30; G01D 5/34; G06K 7/10

U.S. Cl. 350—96.15 **10 Claims**



1. A readhead for an optical encoder comprising:

at least one glass substrate; and

a plurality of ion diffused optical transmission channels formed in the interior region of each said glass substrate, said optical transmission channels incuding a plurality of spaced apart optical waveguides for supplying light to a

predetermined region of said optical encoder and for receiving light that is reflected from said predetermined region of said optical encoder, said optical transmission channels also including at least one optical waveguide for supplying light to said optical transmission channel and for outputting light from said optical transmission channel;

each said optical transmission channel further including an optical mixer section located intermediate to said plurality of optical waveguides and said at least one optical waveguide with said optical mixer section being in optical communication with both said plurality of optical waveguides and said at least one optical waveguide.

4,953,934

WAVEGUIDE TYPE LIGHT MERGING AND BRANCHING DEVICE

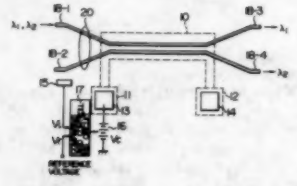
Katsuyuki Imoto, Hitachi; Hirohisa Sano, Kokubunji; Masaru Miyazaki, Ome; Naoyuki Matsuoka, Kokubunji, and Hisato Uetsuka, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 280,855

Claims priority, application Japan, Dec. 9, 1987, 62-309652

Int. Cl.[5] G02B *6/26*

U.S. Cl. 350—96.15 **2 Claims**



1. A waveguide type light merging and branching device comprising:

a substrate;

a resistance layer arranged on at least one side of said substrate, having electrodes through which a voltage is applied;

a low refractive index layer superposed on said substrate with the resistance layer;

two core waveguide layers, arranged in parallel on said low refractive index layer;

a cladding layer covering said two core waveguide layers; and

thermo-detecting element disposed on said cladding, wherein the voltage applied to the resistance layer is varied by the output of said thermo-detecting element.

4,953,935

INTEGRATED OPTIC STAR COUPLER

Paul G. Suchoski, Jr., East Hartford; Talal K. Findakly, and Frederick J. Leonberger, both of Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 27, 1989, Ser. No. 328,940

Int. Cl.[5] G02B *6/28*; G02F *1/00*

U.S. Cl. 350—96.16 **12 Claims**

1. A single polarization integrated optic (IO) star coupler, comprising:

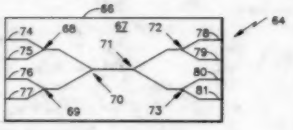
substrate means, comprising a refractive material having a major surface; and

star coupler array means, including one or more 1×2 optical power splitter means disposed in cascade on said major surface to provide an array having N number of signal inputs and M number of signal outputs arranged in an N×M star coupler architecture;

as characterized by:

said star coupler array means being formed in said major surface by a two step proton exchange (TSPE) process comprising the steps of:

immersing said substrate, for a period of from two to sixty minutes, in a benzoic acid bath at a temperature of from 150°C to 250°C;



removing said substrate from said bath following said step of immersing; and

appealing said substrate for period of from one to five hours at temperature of from 300°C to 400°.

4,953,936

OPTICAL WAVEGUIDE MODULE WITH FIBER COUPLING

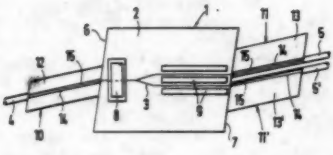
Rolf Regener, Schorndorf, and Joachim Scholz, Marbach, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz Aktiegesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 1, 1989, Ser. No. 401,937

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831905

Int. Cl.[5] G03B *6/30*

U.S. Cl. 350—96.17 **4 Claims**



1. In an integrated optical waveguide module with fiber coupling including a substrate which supports at least one integrated optical waveguide whose ends are each optically coupled, at two sides of the substrate, to one end of a respective optical fiber fixed in the groove of a respective holder attached, after adjustment, to the substrate; the improvement wherein: each holder is a fillet-shaped supporting body having a respective said groove on its top side which extends in the direction of the longitudinal axis of the supporting body; the fiber end of each respective optical fiber is free of a primary coating and an outer jacket and is completely sunk and embedded in adhesive in a respective said groove; and each of said fiber end and each said supporting body is formed of quartz glass.

4,953,937

ILLUMINATION OPTICAL SYSTEM

Akira Kikuchi, and Katsuya Ono, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 16, 1989, Ser. No. 352,492

Claims priority, application Japan, May 17, 1988, 63-118154; Oct. 25, 1988, 63-267196; Mar. 28, 1989, 1-73796

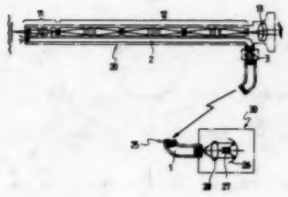
Int. Cl.[5] G02B *6/32*

U.S. Cl. 350—96.18 **38 Claims**

1. An illumination optical system comprising a surface-shaped light source having a two-dimensional extent across an optical axis, and a positive lens system positioned so as to have its front focal point in the vicinity of the light source, said lens

system being adopted to receive light from said light source and to direct the received light toward a surface to be illuminated, the illumination optical system being designed to satisfy a following condition (1) at more than 50% of the sectional area of effective light flux within the range defined by the following condition (2),

$$(d\theta/dr_1)/(d\theta/dr_1)r_1=0<f/\sqrt{f^2-r_1^2} \quad (1)$$



$$0\leq|r_1|\leq|f| \quad (2)$$

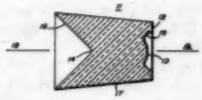
wherein the reference symbol r_1 represents distance as measured from the optical axis to an optional point on said surface-shaped light source, the reference symbol θ designates angle of incidence on a surface to be illuminated formed between the optical axis and the ray emerging from said point in parallel to the optical axis and incident on said illuminated surface, and the reference symbol f denotes focal length of said lens system.

4,953,938

OPTICAL FIBER EXPANDED BEAM CONNECTOR

Carl F. Buhrer, Framingham, and Alfred H. Bellows, Wayland, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 28, 1985, Ser. No. 791,669
Int. Cl.[5] G02B 6/32
U.S. Cl. 350—96.18 **10 Claims**



1. A lensing and alignment device for an optical fiber comprising an integral body of optical quality transparent material formed in a generally truncated conical configuration, said body having a conical axis, said body having a base at one end thereof, said body having a planar, annular, reference surface at the other end thereof,

(A) said body, at said other end, having

(1) said planar surface perpendicular to said axis,

(2) a lens having a convex surface formed in said body, recessed inward from said reference surface, and

(3) curved surface means surrounding said lens surface for serving as a smooth transition toward said planar reference surface; and

(B) said body, at said one end, having

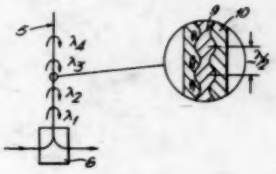
(1) a truncated, conical depression terminating at a circular, planar surface having a center coinciding with the focal point of said lens, said circular planar surface being perpendicular to said axis, said focal point lying on said axis, wherein said base has a diameter d_1, said annular surface has an outer diameter d_2, and where $d_1 \neq d_2$.

4,953,939

OPTICAL FIBRE TRANSMISSION SYSTEMS

Richard E. Epworth, Bishops Stortford, Great Britain, assignor to STC PLC, London, England

Continuation of Ser. No. 749,050, Jun. 26, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 134,549
Claims priority, application United Kingdom, Jul. 11, 1984, 8417662
Int. Cl.[5] G02B 6/34
U.S. Cl. 350—96.19 **17 Claims**



1. A chromatic dispersion equaliser which produces an equalising optical delay for an optical signal having variable wavelength and transmitted along an optical fiber, which variable wavelength results in chromatic dispersion in the form of unwanted delay of the transmitted optical signal, which unwanted delay varies with the variations in the wavelength and which equalising optical delay is to compensate for said unwanted delay, the optical fibre having a delay versus wavelength characteristic with a minimum delay at a particular wavelength, the delay decreasing with increasing wavelength up to said particular wavelength and increasing with increasing wavelength after said particular wavelength, the chromatic dispersion equaliser comprising a chirped Bragg reflector and directional coupler means associated with the chirped Bragg reflector, the directional coupler means, in use of the equaliser, coupling the optical signal transmitted along the optical fiber to the chirped Bragg reflector and redirecting the optical signal as reflected by the chirped Bragg reflector back into the optical fiber to continue its transmission therealong, the chirped Bragg including means responsive to the wavelength to vary the distance the optical signal travels through the chirped Bragg reflector before reflection depending on the wavelength and to produce said equalising optical delay in response to said wavelength and thus compensate for said unwanted delay and equalise the chromatic dispersion of the transmitted signal, the distance variation being such that for wavelength variations below said particular wavelength longer wavelengths have to travel further distances than shorter wavelengths before said reflection, and for wavelength variations above said particular wavelength shorter wavelengths have to travel further distances than longer wavelengths before said reflection.

4,953,940

OPTICAL FIBER TERMINATION DEVICE HAVING CUTTING MEANS

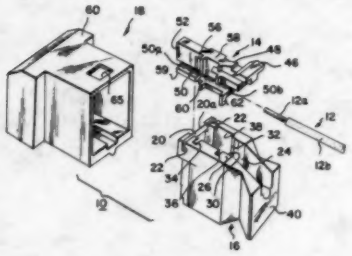
Carmen Lanzetta, Jr., Hatboro; Michael Kiell, Bensalem, both of Pa.; Guenter Schindler, Lakewood, and Russell H. Williams, Flemington, both of N.J., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Jan. 24, 1985, Ser. No. 694,353
Int. Cl.[5] G02B 6/36, 7/26
U.S. Cl. 350—96.20 **6 Claims**

1. An apparatus for cutting an optical fiber with a cutting device and terminating said optical fiber, said apparatus comprising:

a first housing defining a channel and supporting said cutting device across a portion of said channel; and

a second housing insertably received in said first housing for supporting said fiber; said second housing including first and second integrally attached spaced-apart fiber accommodating portions each for accommodating and supporting respectively and end extent of said fiber and a successive spaced-apart longitudinal extent of said fiber, said first and second fiber accommodating portions defining a passage thereinbetween which receives said cutting device



upon insertion of said second housing into said first housing to thereby sever said fiber between said first and second spaced-apart fiber accommodating portions and to thereby define a fiber termination surface adjacent to said passage; said second fiber accommodating portion being resident interiorly of said first housing channel and said first fiber accommodating portion being resident exteriorly of said first housing channel upon insertion of said second housing into said first housing; and wherein said first fiber accommodating portion is frangibly removable from said second fiber accommodating portion.

4,953,941

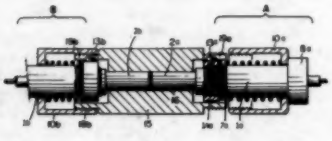
OPTICAL FIBER CONNECTING DEVICE

Mitsuo Takahashi, Matsudo, Japan, assignor to Seikoh Giken Co., Ltd., Chiba, Japan

Filed Nov. 21, 1988, Ser. No. 274,184

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.20 **6 Claims**



1. An optical fiber connecting device comprising a pair of optical connector plug assemblies and an aligning sleeve, each of said pair of optical connector plug assemblies including:

a ferrule member having a central hole for receiving and holding an optical fiber, said ferrule member including a threaded portion formed on an outer-diameter portion thereof adjacent one end;

a cylindrical position-determining movable ring slidably fitted around the outer-diameter portion of said ferrule member and having an internally threaded through-hole rotatably engaged with the threaded portion of said ferrule member, said cylindrical position-determining movable ring further having a position-determining key on an outer-diameter portion of said ring;

a ferrule member-urging compression coil spring; and

an engagement nut formed with an internally threaded hole, said coil spring and engagement nut being slidably fitted around the outer-diameter portion of said ferrule member.

4,953,942

OPTICAL FIBER CABLE AND METHOD OF MAKING THE SAME

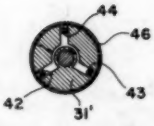
Kazuya Sasaki, Mitaka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 4, 1989, Ser. No. 332,733

Claims priority, application Japan, Apr. 8, 1988, 63-087633

Int. Cl.[5] G02B *6/44*; D02G *3/36*; B21D *3/00*

U.S. Cl. 350—96.23 **20 Claims**



1. A method of making an optical fiber cable, comprising the steps of:

(a) providing a flat-type spacer having a straight groove along a length thereof and positioning an optical fiber therein along substantially the same plane; and

(b) forming the straight groove into a closed space in which the optical fiber is held, by transforming the flat-type spacer into a circular rod-type spacer while the optical fiber remains positioned in the groove.

11. An optical fiber cable, comprising:

(a) a plurality of optical fibers;

(b) spacer means, for holding and protecting the optical fibers in closed spaces, the spacer means including a plurality of section blocks connected together to form a plurality of closed spaces between adjacent blocks in which the optical fibers are positioned; and,

(c) a tension member positioned in the center of the spacer means and formed within a portion of one of the blocks.

4,953,943

SECOND HARMONIC WAVE GENERATING DEVICE

Yasumitsu Miyazaki, Aichi; Ryo Enomoto, and Masaya Yamada, both of Gifu, all of Japan, assignors to Ibiden Co., Ltd., Gifu-Ken, Japan

Filed Dec. 19, 1989, Ser. No. 452,506

Claims priority, application Japan, Mar. 30, 1989, 61-76853; Apr. 7, 1989, 61-86885; Nov. 16, 1989, 61-298600

Int. Cl.[5] G02B *6/10*

U.S. Cl. 350—96.12 **8 Claims**

1. A second harmonic wave generating device comprising a $LiNbO_3$ thin film waveguide layer formed on a $LiTaO_3$ substrate, characterized in that a fundamental wavelength (λ μm), a thickness (T μm) of said $LiNbO_3$ thin film waveguide layer, an ordinary refractive index (n_{oS1}) of said $LiTaO_3$ substrate at said fundamental wavelength (λ μm), an ordinary refractive index (n_{oF1}) of said $LiNbO_3$ thin film waveguide layer at said fundamental wavelength (λ μm), an extraordinary refractive index (n_{eS2}) of said $LiTaO_3$ substrate at a second harmonic wavelength (λ μm/2), and an extraordinary refractive index (n_{eF2}) of said $LiNbO_3$ thin film waveguide layer at said second harmonic wavelength (λ μm/2) are individually within the following specific values:

λ=0.68 to 0.94 μm

T=0.3 to 16 μm

n_{oF1}=2.22 to 2.38

n_{oS1}=2.10 to 2.25

n_{eF2}=2.24 to 2.42

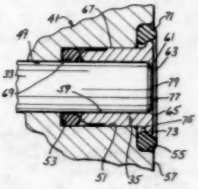
n_{eS2}=2.22 to 2.38

4,953,944

MULTI-CHANNEL HERMAPHRODITIC LENS TYPE FIBER OPTIC CONNECTOR

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 12, 1988, Ser. No. 256,686
Int. Cl.[5] G02B 6/38
U.S. Cl. 350—96.21 9 Claims



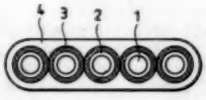
1. A lens-type connector comprising:
a connector body having a passage extending therethrough in a first direction;
a bushing fixedly retained in the passage of the connector body and having a bushing passage extending generally in said first direction completely through the bushing, the passage including a bore and a counterbore at the end of the connector body, said bushing received in the counterbore;
said bushing having a radially inwardly projecting shoulder in said passage of said bushing and an annular interface seal circumscribing the bushing at said one end of the connector body and means including the bushing for retaining the seal; and
a graded index rod in said passages, said graded index rod having an end face and being movable in said first direction in said passages, said shoulder and the end face of said graded index rod having mating conical surfaces which engages when the index rod is urged against the shoulder, whereby the end face of the graded index rod can be urged against said shoulder to at least assist in centering and retaining the graded index rod in said passages.

4,953,945

TRANSMISSION PROTECTIVE COATED OPTICAL FIBER TAPE

Akira Nishimura, and Masaaki Nakasuji, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 2, 1988, Ser. No. 201,407
Claims priority, application Japan, Jun. 3, 1987, 62-86458[U]; Apr. 11, 1988, 63-48541[U]
Int. Cl.[5] G02B 6/44
U.S. Cl. 350—96.23 1 Claim



1. A coated optical fiber tape comprising:
a plurality of optical fibers each having a coating and being aligned parallel in the same plane,
a common coating layer covering the area of said optical fibers, and
a peelable cured coating layer being provided between each of the coatings on the optical fibers and said common coating layer to prevent the latter from being bonded to said coatings on the optical fibers, said peelable cured coating layer comprising a material having a compression modulus of elasticity of at least 5 kg/mm^2 but not exceeding 300 kg/mm^2.

4,953,946

CABLES WITH LOW MS HEC WATER-BLOCKING MATERIAL

Serge Huybrechts, Doune, Great Britain, assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

PCT No. PCT/EP88/00159, § 371 Date Feb. 13, 1988, § 102(e) Date Feb. 13, 1988, PCT Pub. No. WO88/06741, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 3, 1988, Ser. No. 272,700
Claims priority, application United Kingdom, Mar. 7, 1987, 8704938
Int. Cl.[5] G02E 6/44; H02G 15/20
U.S. Cl. 350—96.23 6 Claims

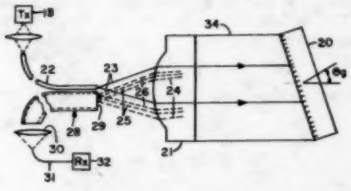
1. An electrical or fibre optic cable comprising one or more conductive filaments within a protective sheath and having a hydroxyethyl cellulose powder between the protective sheath and the filaments wherein the improvement comprises using hydroxyethyl cellulose which has a hydroxyethyl molar substitution, i.e. an MS value, of from about 0.7 to about 1.25 and has not been treated with glyoxal.

4,953,947

DISPERSION TRANSFORMER HAVING MULTICHANNEL FIBER

Venkata A. Bhagavatula, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Aug. 8, 1986, Ser. No. 894,575
Int. Cl.[5] G02B 6/22
U.S. Cl. 350—96.33 8 Claims



1. An optical fiber transmission system dispersion transformer comprising
a multimode optical waveguide having an input endface and an output endface, and
means for dispersing a light beam into a plurality of spatially separated beams and for directing said beams onto a portion of said input endface,
said multimode optical waveguide being characterized in that it comprises a plurality of light-conducting channels, adjacent ones of which are separated by cladding regions having refractive indices lower than those of said light conducting channels, said multimode optical waveguide

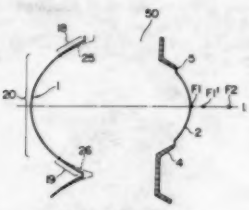
being a planar structure having a substrate on which there is disposed a plurality of light conducting laminae, adjacent ones of which are separated by a cladding lamina of lower refractive index than said light conducting laminae.

4,953,948

REAR PROJECTION SCREEN

Akira Ito, Atsugi, and Mizuo Okada, Yokohama, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 294,875
Claims priority, application Japan, Jan. 14, 1988, 63-4985
Int. Cl.[5] G03B *21/60*
U.S. Cl. 350—128 **6 Claims**



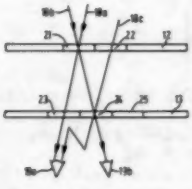
1. In a rear-projection screen having an entrance side and an exit side, said screen being formed with a plurality of entrance lenses on said entrance side each having a center portion and side portions at both sides of said center portion, and having a plurality of exit lenses corresponding to said entrance lenses formed on said exit side, and wherein light rays incident upon said entrance lenses are emitted from said exit lenses, the improvement wherein each of said entrance lenses has a cross-section defined by a line having a center part corresponding to said center portions and side parts corresponding to said side portions, said center part and said side parts of said line having respective light converging characteristics which are different from each other, wherein said center part of said line is defined by a secondary order algebraic curve, and wherein the inclination of said side parts of said line is more gentle than that of said center part.

4,953,949

DEVICE FOR FORMING A PICTURE

William J. Dallas, Tucson, Ariz., assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 810,440, Dec. 17, 1985, abandoned.
This application Apr. 28, 1989, Ser. No. 346,275
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445973
Int. Cl.[5] G02B *27/22*
U.S. Cl. 350—130 **8 Claims**



1. A device for forming a picture from picture elements too small to be resolved by human eyes at normal viewing distances comprising

a first transparent constituent picture including a distributed plurality of adjacent first picture elements in a first plane, each of said first picture elements being of a size too small to be resolved by human eyes at normal viewing distances,

a second transparent constituent picture disposed behind said first transparent constituent picture in a viewing direction but separated from said first transparent constituent picture by a small amount, said second transparent constituent picture including a distributed plurality of adjacent second picture elements in a second plane, each of said second picture elements also being of a size too small to be resolved by human eyes at normal viewing distances, and

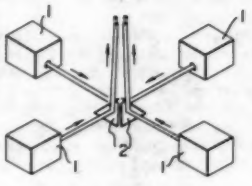
a composite picture provided to said human eyes at said normal viewing distances from said first and second constituent pictures, said composite picture including a distributed plurality of third picture elements, said third picture elements having a transmittance equal to the product of the respective transmittance of said first and second picture elements forming said third picture elements, said composite picture having a transmittance equal to an average value of the products of transmittance of said first and second constituent pictures.

4,953,950

APPARATUS FOR PRODUCING ULTRA-HIGH POWER ULTRA-HIGH DENSITY LASER BEAM

Yoshiaki Arata, 3-13-11, Mukonoso, Amagasaki-shi, Hyogo, and Tatsuharu Oda, 2-17-2, Shinsenri Minamimachi, Toyonaka-shi, Osaka, both of Japan

Filed Nov. 15, 1988, Ser. No. 271,270
Claims priority, application Japan, Apr. 30, 1987, 62-107675
Int. Cl.[5] G02B *27/14, 17/06*
U.S. Cl. 350—174 **4 Claims**



1. The apparatus for generating an ultra-high power, ultra-high density pseudo-single laser beam, comprising:

a plurality of lasers arranged in a plane radially around a reference axis, each generating a laser beam toward the reference axis; and

a plurality of directing mirrors arranged, in the same plane as said plurality of lasers, at such an angle with respect to said lasers as to converge reflected beams of said laser beams into a limited narrow space.

4,953,951

METHOD FOR MAKING HOLOGRAMS WITH COHERENT RADIATION FROM A STABILIZED LASER DIODE THAT HAS BEEN ACTIVELY COOLED

Gail C. Gilbreath, Accokeek, Md., and Anne E. Clement, Birmingham, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 13, 1988, Ser. No. 143,492
Int. Cl.[5] G03H *1/00*
U.S. Cl. 350—320 **12 Claims**

1. A method for repeatably constructing a viable hologram with good wavefront fidelity and high diffraction efficiency made with a mode stabilized laser diode by exposing a recording medium sensitive to infrared coherent radiation which is characteristic of laser diode emission, comprising the steps of:

running an actively cooled laser diode at a specific current density for an interval prior to exposing a recording me-

dium to stabilize single-mode radiation from the diode and monitoring the diode's modal response indicating that the diode is producing a specific wavelength of coherent radiation as a result of being actively cooled immediately prior to exposure, and turning off said active cooling means and other sources of environmental instability;

constructing an interference pattern from the coherent radiation via an interferometer, and exposing a recording medium to the formed interference pattern for an interval of sufficient duration to form a hologram in the medium once the medium is developed, the interval being short enough that the intensity of the radiation incident on the medium does not suffer attenuation; and

developing the exposed recording medium to form said hologram.

4,953,952

COLOR LIQUID CRYSTAL DISPLAYING PANELS

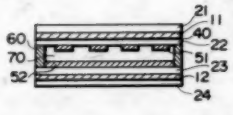
Takuzo Okumura, Tokyo; Toyokazu Okada; Hitoshi Kikui, both of Osaka, and Kazuo Nakata, Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 858,727, May 2, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 218,487

Claims priority, application Japan, May 2, 1985, 95103/85

Int. Cl.[5] G02F *1/133*

U.S. Cl. 350—337 **6 Claims**



1. A color liquid crystal display panel comprising:

a liquid crystal layer; and

a first light-polarizing plate arranged on a first side of said liquid crystal layer, said first light-polarizing plate including layers in the following order: a first exterior protective film layer of non-rotary polarization polymer, a first light-polarizing layer, a first color filter layer of three primary colors formed with pigments or dyes and having no polarizing layer, a second protective film layer comprising a non-rotatory polarization polymer having an outside surface upon which an inner surface of said first color filter layer is formed, and a first transparent conductive layer formed on the inside surface of said second protective film layer and being in contact with said liquid crystal layer; and

a second light-polarizing plate arranged on a second side of said liquid crystal layer opposite to said first side, said second light-polarizing plate including layers in the following order: a third exterior protective film layer of non-rotatory polarization polymer, a second light-polarizing layer, a fourth protective film layer of non-rotatory polarization polymer and a second transparent conductive layer formed on an inside surface of said fourth protective film layer and being in contact with said liquid crystal layer.

4,953,953

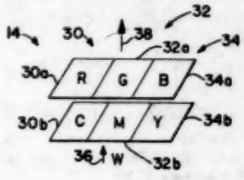
COMPLEMENTARY COLOR LIQUID DISPLAY

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Continuation of Ser. No. 358,574, May 26, 1989, which is a continuation of Ser. No. 942,517, Dec. 16, 1986, Pat. No. 4,834,508, which is a continuation-in-part of Ser. No. 707,486, Mar. 1, 1985, abandoned. This application Dec. 21, 1989, Ser. No. 456,060

Int. Cl.[5] G02F *1/13*

U.S. Cl. 350—339 F **16 Claims**



1. A method for producing a light output, comprising directing light to a plurality of color aligned in optical series, wherein a first one of such filters has one color characteristic and a second one of such filters has the complementary color characteristic, and controlling the amount of filtering by at least one of such filters, whereby such light output has characteristics that are a function of the filtering of both such first and second filters.

9. Apparatus for producing a light output, comprising means for directing light to a plurality of color filters aligned in optical series, said plurality of color filters including a first filter having one color characteristic and a second filter having the complementary color characteristic, and means for controlling the amount of filtering by at least one of said filters, whereby such light output has characteristics that are a function of the filtering of both said first and second filters.

4,953,954

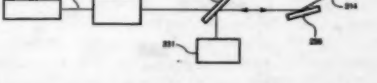
PHASE-CONJUGATE COMMUNICATION USING MUTUALLY INCOHERENT LASER BEAMS

Mark D. Ewbank, Newbury Park; Tallis Y. Chang, Woodland Hills, and Jack L. Feinberg, Manhattan Beach, all of Calif., assignors to Rockwell International Corporation, Thousand Oaks, Calif.

Filed Feb. 10, 1989, Ser. No. 308,580

Int. Cl.[5] G07B *5/23*; H04B *1/00*; G02F *1/60*

U.S. Cl. 350—354 **30 Claims**



1. A phase-conjugate optical communication system, comprising:

a first source of coherent radiation for producing a first beam having a nominal wavelength λ;

a first modulator for temporally modulating the first beam;

a second source of coherent radiation, mutually incoherent with the first source, for producing a second beam having the nominal wavelength λ;

a second modulator for temporally modulating the second beam; and

a mutually pumped phase conjugator, the conjugator being positioned such that the first and second beams fan in the conjugator and produce a set of shared fanning holograms,

the holograms causing a third beam, which is the phase conjugate of the first beam and on which is imposed the temporal modulation of the second beam, to be diffracted in a direction opposite to the first beam and causing a fourth beam, which is the phase conjugate of the second beam and on which is imposed the temporal modulation of the first beam, to be diffracted in a direction opposite to the second beam.

4,953,955

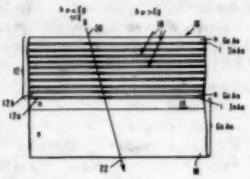
PHOTOVOLTAIC DRIVEN MULTIPLE QUANTUM WELL OPTICAL MODULATOR

Joseph Maserjian, Goleta, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 149,653, Jan. 28, 1988, Pat. No. 4,818,079, which is a division of Ser. No. 3,633, Jan. 15, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,739

Int. Cl.[5] G02F *1/01*

U.S. Cl. 350—354 **18 Claims**



1. An internally photovoltaically driven optical modulator comprising a multiple quantum well structure formed on a substrate layer of a first material, said multiple quantum well structure comprising a plurality of alternating layers of said first material and a second material, said first material having a bandgap greater than that of said second material, said layers of said first material each comprising a doped semiconductor provided with a selectively-doped profile across the thickness of each layer thereof and forming a plurality of space charge barriers having predetermined tunneling times by control of doping and thickness thereof and said second material comprising an undoped semiconductor.

4,953,956

LIQUID PRISM DEVICE

David J. Carpenter, 3309 4th St., Boulder, Colo. 80302

Filed Jun. 10, 1988, Ser. No. 205,367

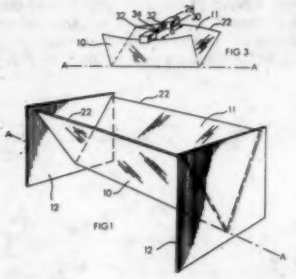
Int. Cl.[5] G02B *3/14, 5/04*

U.S. Cl. 350—419 **13 Claims**

1. An apparatus for producing an effect on light passing through portions of the apparatus, comprising:

a container formed of a pair of rectangular plates joined along one longitudinal edge thereof to form an upright "V" shaped trough, said plates having their other longitudinal edges spaced to form the upper ends of the angularly spaced legs of the "V" shape, said plates each having at least a portion being translucent;

end cap means sealingly enclosing the end edges of the plates to form a V shaped trough with its open side facing upwardly and ends enclosed so as to hold a fluid therein, said



end caps being rigid to hold the lateral edges at the ends of the plates in a fixed configuration.

4,953,957

ZOOM LENS SYSTEM

Yuko Kobayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

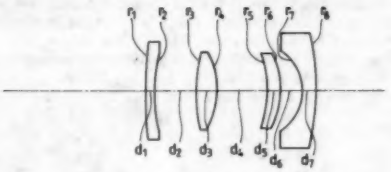
Filed Mar. 21, 1989, Ser. No. 326,633

Claims priority, application Japan, Mar. 24, 1988, 63-70730

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[5] G02B *15/14, 9/58*

U.S. Cl. 350—423 **6 Claims**



1. A zoom lens system comprising a lens group having positive refractive power and another lens group having negative refractive power, and so adapted as to perform variation of focal length by varying the airspace reserved between said lens groups, said lens group having the positive refractive power comprising at least one graded refractive index lens component having the shape of a negative meniscus lens and a refractive index distribution wherein refractive indices are lowered as the lens portions are farther from the optical axis in the direction perpendicular to the optical axis and, when the refractive index distribution of said graded refractive index lens is given by the following formula, said zoom lens system satisfying the following condition (1):

$$n(y)_d = N_{0d} + N_{1d}y^2 + N_{2d}y^4 + \dots$$

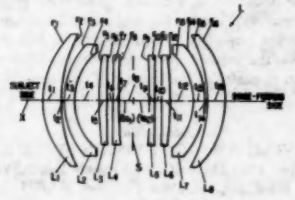
$$-12 < N_{1d} f_w^2 < -0.5 \quad (1)$$

wherein the reference symbol y represents distance from the optical axis in the direction perpendicular to the optical axis, the reference symbol $n(y)_d$ designates refractive index for the d-line at the distance y, the reference symbol N_{0d} denotes refractive index for the d-line on the optical axis, the reference symbol N_{1d}, N_{2d}, . . . represent the coefficients of refractive index distribution for the d-line, and the reference symbol f_w designates focal length of the zoom lens system as a whole at the wide position thereof.

4,953,958
VARIABLE MAGNIFICATION DUPLICATOR LENS SYSTEM

Toshiaki Katsuma, and Nagayoshi Hirano, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Dec. 23, 1988, Ser. No. 289,379
Claims priority, application Japan, Jan. 14, 1988, 63-6623
Int. Cl.[5] G02B 15/00
U.S. Cl. 350—425 5 Claims



1. A variable magnification duplicator lens system which comprises:

a couple of lens groups each consisting of four lens elements and located on the opposite sides of a stop, one on a subject side and the other on an image-forming side;

said lens elements of the lens group on the subject side of the stop including a 1st lens consisting of a meniscus lens of positive power facing the convex side thereof toward the subject, a 2nd lens consisting of a meniscus lens of negative power facing the convex side thereof toward the subject, a 3rd lens of positive power and a 4th lens of negative power;

said lens elements of the lens group on the image-forming side including a 5th, 6th, 7th and 8th lens elements arranged symmetrically with said 1st, 2nd, 3rd and 4th lens elements on the subject side;

of said lens elements, said 3rd, 4th, 5th and 6th lens elements as well as at least one of said 1st and 8th lens elements being movable;

said lens system being movable in the direction of the optical axis for a change of copy scale;

said lens system being set in reduced scale position by either a lens position adjustment shifting said 5th and 6th lens elements into positions closer to said stop and shifting said 8th lens element closer to said stop and shifting said 8th lens element closer to 7th lens element, or a lens position adjustment shifting said 1st lens element away from said 2nd lens element; and

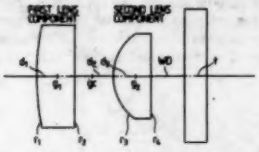
said lens system being set in an enlarged scale position by either a lens position adjustment shifting said 3rd and 4th lens elements into positions closer to said stop and shifting said 1st lens element closer to said 2nd lens element, or a lens position adjustment shifting said 8th lens element away from said 7th lens element;

4,953,959
OBJECTIVE LENS FOR OPTICAL DISKS

Hiroshi Ishiwata, Yokosuka; Tetsuo Ikegame, and Ichiro Ikari, both of Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 8, 1989, Ser. No. 348,680
Claims priority, application Japan, May 12, 1988, 63-115172
Int. Cl.[5] G02B 13/18
U.S. Cl. 350—432 8 Claims

1. An objective lens for optical disks comprising at least a first lens component provided in a position farthest from an information recording medium and a second lens component provided adjacent to said first lens component across an airspace for recording and/or reproducing information in regard to an information recording medium, wherein each of said first lens component and said second lens component has positive refractive power and, when the focal length of said objective lens is taken as f, the focal length and refractive index of said second lens component as f_2 and n_2, respectively, and the radius of curvature of a surface of said second lens component, nearest to said first lens component, as r_3, said objective lens satisfies the following conditions:



$$0.8<f/f_2<1.1$$

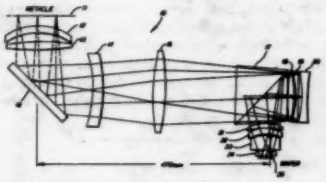
$$0.7<(n_2-1)f/r_3<1.1$$

and the surface of said second lens component, nearest to said first lens component, is configured as an aspherical surface.

4,953,960
OPTICAL REDUCTION SYSTEM

David M. Williamson, 26 Chimney Dr., Bethel, Conn. 06801

Filed Jul. 15, 1988, Ser. No. 223,968
Int. Cl.[5] G02B 17/00
U.S. Cl. 350—442 15 Claims



1. A catadioptric optical reduction system comprising from the long conjugate end to the short conjugate end:

a first lens group;

a beamsplitter;

a second lens group;

a reduction mirror;

a third lens group;

arranged such that radiation entering said system passes through said first lens group, said beamsplitter, said second lens group and is reflected by said reflector back through said second lens group and is reflected by said beamsplitter through said third lens group.

4,953,961
LIGHT BEAM POSITIONER

Shivadev K. Ubhayakar, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

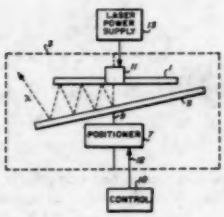
Filed Jan. 31, 1989, Ser. No. 304,148
Int. Cl.[5] G02B 26/08
U.S. Cl. 350—486 36 Claims

1. Apparatus for radially and elevationally positioning an electromagnetic energy beam produced by an electromagnetic energy source, which comprises in combination:

a pair of electromagnetic energy reflectors, each of said electromagnetic energy reflectors having an electromagnetic energy reflecting surface; said reflectors being lo-

cated with one of said reflectors overlying the other to define a region therebetween with the respective electromagnetic energy reflecting surfaces facing one another to reflect electromagnetic energy therebetween; one of said electromagnetic energy reflecting surfaces being of a larger area than the other one of said surfaces and one of said surfaces being inclinable at an angle in three dimensions to the other to define a bisecting plane of symmetry with respect thereto, whereby said bisecting plane of symmetry may be selectively oriented in radial direction;

control means coupled to one of said electromagnetic energy reflecting surfaces for selectively varying said angle of incline of said coupled surface relative to the other



electromagnetic energy reflecting surface and for radially positioning said bisecting plane of symmetry; and

means for inputting an electromagnetic energy beam produced by said electromagnetic energy source into said region with said beam entering said region in a direction orthogonal to one of said electromagnetic energy reflecting surfaces and coaxial with said one surface; whereby said electromagnetic energy beam undergoes multiple reflections at the reflecting surfaces as the beam propagates in the region between said surfaces and exits from between said surfaces at an angle relative to the surface of the one of said electromagnetic energy reflecting surfaces having the greater size and at a radial direction determined by said control means.

4,953,962

MICROSCOPE OBJECTIVE FOR ACCOMMODATING DIFFERENT COVER-GLASS THICKNESSES

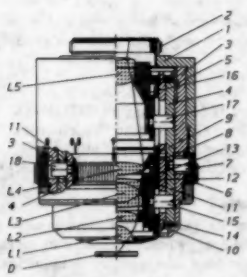
Karlheinz Esswein, and Ludwig Kummer, both of Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 331,683

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812745

Int. Cl.[5] G02B *21/02, 11/30*

U.S. Cl. 350—507 **17 Claims**



1. In a microscope for observing objects covered by cover-glasses of differing thicknesses, an objective having a linear magnification of between 32× and 60×, an aperture of at least 0.5, and an optical axis along which are aligned, in the order of light transmission, a stationary first lens (L1), a movable second lens (L2/L3), and a stationary third lens (L4), said microscope objective comprising:

a. a movable fourth lens (L5) arranged beyond said third lens in said order of light transmission; and

b. an adjusting device, selectively positionable in accordance with the thickness of the cover-glass covering an object being observed, for moving said second and fourth lenses to adjust the objective to compensate for said cover-glass thickness, the movement of said fourth lens being in a direction opposite to movement of said second lens.

4,953,963

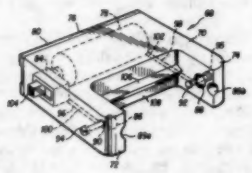
AVIATOR'S NIGHT VISION SYSTEM

Alan K. Miller, 1220 Hubbell Dr., Virginia Beach, Va. 23454

Filed Aug. 17, 1989, Ser. No. 394,875

Int. Cl.[5] G02B *23/00*

U.S. Cl. 350—547 **7 Claims**



1. In improved aviator's night vision system of the type comprising a night vision goggle assembly and a mount for removably attaching the aviator night vision goggle assembly to an aviator's helmet, said mount including a first goggle-assembly receptacle to be fixedly attached to the helmet for removably receiving a goggle assembly plug of the goggle assembly and holding the goggle assembly on said helmet until sufficient force is applied thereto to remove said goggle assembly from said helmet, said first goggle assembly receptacle and said goggle assembly plug respectively including first and second opposite engaging means for engaging one another to allow said goggle assembly to be repeatedly mounted on and removed from said helmet, said first goggle assembly receptacle and said goggle assembly plug further including respective first and second electrical contacts which are in engagement one with the other when said opposite engagement means are engaged, said mount further including a mount power pack including an electrical battery and electrical leads for being mounted on said helmet and supplying electrical energy from said battery to said electrical contact of said first goggle-assembly receptacle to supply energy to said goggle assembly when said goggle assembly is mounted on said helmet;

the improvement wherein is further included a small portable battery pack separate from said first goggle assembly receptacle and said goggle-assembly plug being attachable to said goggle-assembly plug, said portable battery pack comprising a portable battery pack housing for containing a battery with a second goggle assembly receptacle being rigidly affixed thereto, said second goggle assembly receptacle including the same type of engaging means and electrical contacts coupled to said battery as the first engaging means for engaging the second engaging means of said plug and said first contact means for contacting said second contact means of said plug;

whereby, when said goggle assembly plug is removed from said first goggle-assembly receptacle of said mount so that said goggle assembly is not mounted on the helmet, said portable battery pack can be mounted on said goggle

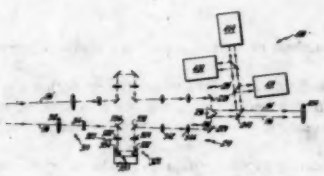
assembly and said goggle assembly is thereby powered and can then be used for enhancing night vision.

4,953,964

PHASED ARRAY TELESCOPE

David Anafi, West Palm Beach, and Philip A. Slaymaker, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 24, 1988, Ser. No. 263,435
Int. Cl.[5] G02B *23/02, 26/06*
U.S. Cl. 350—557 5 Claims



1. An optical telescope system for combining a plurality of telescope sub-images formed from a plurality of sub-beams from a plurality of optical telescopes to form a composite image of an object and comprising a plurality of telescopes, each having an object path length from an object to a first optical element and a telescope path length along a telescope axis from said first optical element to a common reference plane and an input aperture and an exit aperture of a sub-beam; in which system each optical telescope includes telescope path length control means to adjust said telescope path lengths of said plurality of optical telescopes such that each optical telescope delivers a telescope image to said reference plane in phase; and image combining means for combining said plurality of telescope images from said plurality of optical telescopes on a common image surface to form said composite image, characterized in that at least one telescope further includes:

image relay means for relaying an image of said first optical element of said telescope to said common reference plane, said image relay means including at least one optical relay and at least one path length control module;

beam displacement means for controlling a relative reference-plane transverse displacement from said telescope axis at said common reference plane of first and second sub-beams to have the same ratio to a corresponding relative input transverse displacement at said first optical elements of said telescopes of said first and second sub-beams as the ratio of corresponding diameters of said exit and input apertures of said first and second sub-beams, and;

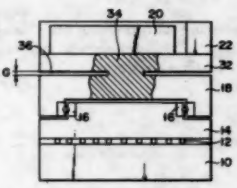
beam tilt means for directing said sub-beams on said common reference plane with a predetermined image tilt angle, said optical relay, control module and beam tilt means being disposed and adjusted to preserve Lagrange invariance between each of said telescope sub-images, whereby said sub-images combine to form said composite image.

4,953,965

HIGH-ACCURACY TRAVELING TABLE APPARATUS

Akira Iwase, and Akira Suzuki, both of Shizuoka, Japan, assignors to Toshiba Machine Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 201,283, May 27, 1988, abandoned, which is a continuation of Ser. No. 945,855, Dec. 23, 1986, abandoned. This application Jun. 15, 1989, Ser. No. 368,150
Claims priority, application Japan, Dec. 26, 1985, 60-291985; Dec. 26, 1985, 60-291986; Feb. 5, 1986, 61-15531[U]; Aug. 25, 1986, 61-129078[U]; Aug. 25, 1986, 61-129079[U]
Int. Cl.[5] G02B *7/18;* A47B *7/00*
U.S. Cl. 350—632 6 Claims



1. A high-accuracy travelling table apparatus comprising:

(a) a base;

(b) a first table mounted on said base for movement relative thereto in a first direction;

(c) at least two guide ways mounted on said first table and extending in a second direction, said second direction being perpendicular to said first direction;

(d) a second table mounted on said at least two guide ways for movement in said second direction, said second table being preloaded in said first direction relative to said at least two guide ways and said second table having a planar upper surface;

(e) a mount having an upper surface and a planar lower surface that is parallel to said planar upper surface of said second table, said mount being a little thinner than said second table;

(f) a partial coupling portion extending from a central portion of said planar upper surface of said second table to a central portion of said planar lower surface of said mount, said partial coupling portion providing the sole support for said mount and the length of said partial coupling portion being small relative to the thickness of said mount, whereby said planar lower surface of said mount and said planar upper surface of said second table are separated by a gap the thickness of which is nominally equal to the length of said partial coupling portion, and the thickness of said gap is small relative to the dimensions of said partial coupling portion perpendicular to said gap;

(g) a workpiece fixing means mounted on said upper surface of said mount; and

(h) a laser mirror mounted on said upper surface of said mount.

4,953,966

SPECTACLE FRAME

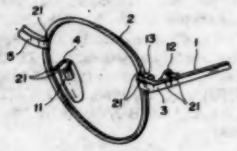
Kazuo Segoshi; Toshiyuki Okuda; Kenji Okamura, and Mizuo Yoshida, all of Fukui, Japan, assignors to Sigma Co., Ltd., Fukui, Japan

Filed Jan. 6, 1989, Ser. No. 294,192
Int. Cl.[5] G02C *1/00*
U.S. Cl. 351—41 3 Claims

1. A spectacle frame comprising:

a face-contacting portion formed of a shape memory alloy; a lens-fixing portion formed of a shape memory alloy; and a connecting member formed of a β-phase titanium alloy

connecting said face-contacting portion and said lens-fixing portion with each other,



said face-contacting portion and said lens-fixing portion being soldered to said connecting member with a palladium based soldering material.

4,953,967

NASION-SECURED SPORT GLASSES

Walter D. Somerville, P.O. Box 223254, Carmel, Calif. 93922

Filed May 31, 1989, Ser. No. 359,706

Int. Cl.[5] G02C *5/12*

U.S. Cl. 351—136 **8 Claims**

1. An ophthalmic device, comprising:

at least one lens,

mounting means for holding said lens in front of the eyes of a wearer,

a nose rest attached to a rear side of said mounting means facing said wearer,

said nose rest made of a material having at least a small amount of flexibility, said nose rest having a configuration comprising an essentially flat forehead rest, a nasion protrusion below said forehead rest sized and shaped to mate with a human nasion, said nasion protrusion extending rearwardly from said flat forehead rest, and two legs sized and shaped to straddle a human nose bridge below said nasion protrusion, and

holding means for urging said nasion protrusion into said nasion when said ophthalmic device is held by said mounting means in front of said eyes of said wearer, said holding means lying in a horizontal plane substantially aligned with said nasion protrusion, thereby to urge said nasion protrusion directly into said nasion and hence securely hold said ophthalmic device upon said wearer's face.

4,953,968

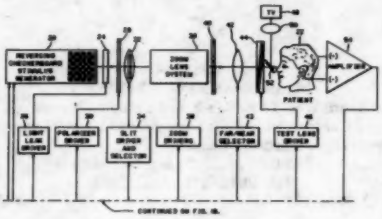
AUTOMATED VISUAL ASSESSMENT SYSTEM WITH STEADY VISUAL EVOKED POTENTIAL STIMULATOR AND PRODUCT DETECTOR

Gary W. Sherwin, Yukon; Lewis F. Hanes, Pittsburgh, and Albert L. Schmidt, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 893,758, Aug. 6, 1986, Pat. No. 4,861,154. This application Mar. 22, 1989, Ser. No. 327,046

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—211 **10 Claims**



1. A method of testing a patient's vision, comprising the steps of:

(a) stimulating a patient's visual system with a test image at a stimulus frequency during one of a selected one of refractometry, acuity, astigmatism, contrast and color vision tests;

(b) detecting evoked potentials produced by the test image in the patient's brain at the stimulus frequency during the selected test;

(c) analyzing the evoked potentials produced by the patient during the selected test and displaying the results of the selected test; and

(d) providing a reference image to the patient and having the patient focus on said reference image during the selected test to prevent eye drift.

4,953,969

DEVICE FOR CORRECTING OCULAR REFRACTION ANOMALIES

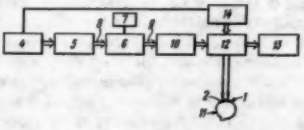
Svyatoslav N. Fedorov, pereulok Dostoevskogo, I/21,kv.32., Moscow, U.S.S.R.

Filed Jul. 11, 1989, Ser. No. 378,030

Claims priority, application U.S.S.R., Jul. 11, 1988, 4457772

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—221 **29 Claims**



26. A device for correcting ocular refraction anomalies, comprising:

an ultraviolet pulsed laser operating at a wavelength of 223 nm;

a uniform light beam former optically connected with said pulsed laser;

a slotted mask optically connected with said uniform light beam former from which a uniform light beam is projected on said slotted mask and having at least two slots, each of which is shaped as a lobe;

a drive for rotating said slotted mask providing for uniform

axisymmetric distribution of ultraviolet radiation over the exposed surface of the cornea;

a means for forming an image of said slotted mask on the corneal surface, said means for forming the image on the corneal surface, positioned at the same optical axis with said slotted mask and having an optical outlet;

a unit to monitor energy density of ultraviolet radiation incident on the corneal surface arranged at said optical outlet of said means for forming the image; a microscope to observe the emission of ultraviolet radiation to the surface of the cornea and the correction process, said microscope being optically connected with said slotted mask image former.

4,953,970

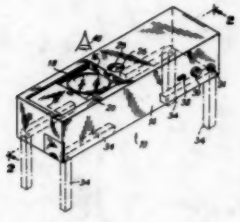
SELF EXAMINATION DEVICE

Arthur Telchin, 160 E. 48th St., New York, N.Y. 10028

Filed May 15, 1989, Ser. No. 352,066

Int. Cl.[5] A61B *3/02*

U.S. Cl. 351—223 **9 Claims**



1. An eye self-examination device for a user comprising a device housing, means for providing a light source, means for adjusting the intensity of the light source by said user, without replacement thereof, and a power supply therefor within said housing for emitting light outside of said housing, an objective lens proximate said light source, a separate reflecting device immediately beneath said objective lens for reflecting an image of an eye from without said housing, through said objective lens, the reflection of said image following a path through said objective lens.

4,953,971

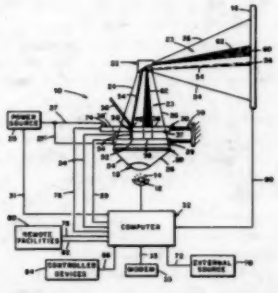
INTERACTIVE IMAGE PROJECTION APPARATUS

Robert R. Highfill, 114 Norway La., Oak Ridge, Tenn. 37830

Filed Oct. 17, 1988, Ser. No. 258,605

Int. Cl.[5] G03B *21/00*

U.S. Cl. 353—122 **13 Claims**



1. An interactive image projection apparatus for the presentation of computer generated images on a projection surface in cooperation with a light source and projection optics for projecting a beam of light from the light source onto the projection surface, comprising:

a substantially transparent image display device for interacting with a computer that generates and sends image-defining signals to the image display device and including means for receiving the image-defining signals from the computer and for producing an image based on said image-defining signals, said image display device being disposed in the beam of light so that the image produced by said image display device is projected onto the projection surface in the beam of light; and

a touch screen for interacting with the computer, at least a portion of said touch screen being substantially transparent and disposed in the beam of light between the display device and the projection surface so that the beam of light passes is sequence through the display device and the touch screen on its way to the projection screen, said touch screen including means for generating a signal when touched and sending the touch-generated signal to the computer for use as input information at the computer so that upon receiving the touch-generated signals, the computer modifies the image produced by the image display device in accordance with the touch-generated signals; and

said touch screen being arranged in close physical proximity to the display device to render the touch screen/image display device arrangement relatively compact.

4,953,972

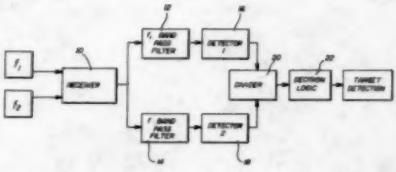
RANGE DISPERSION SENSOR

David M. Zuk, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 27, 1988, Ser. No. 290,754

Int. Cl.[5] G01C *3/08*

U.S. Cl. 356—4 **25 Claims**



1. A range dispersion sensor comprising:

a source operative to provide an output beam of electromagnetic energy;

a modulator associated with the source and operative in conjunction therewith to modulate the output beam at a first frequency "f_1" with a second frequency "f_2";

means for directing said beam of electromagnetic energy onto a target zone for reflection therefrom;

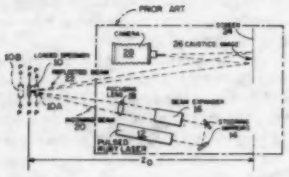
means for detecting the reflected energy and providing a first detector signal corresponding to detected energy modulated at f_1 and a second detector signal corresponding to detected energy modulated at f_2;

and processing means for receiving and comparing said first and second detector signals and providing an output signal corresponding to the ratio thereof said output signal indicative of the range dispersion of said target zone.

4,953,973
DETECTION OF COMPRESSIVE RESIDUAL STRESSES USING THE METHOD OF CAUSTICS

Basil P. Leftheris, Huntington, and Robert C. Schwarz, Dix Hills, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 16, 1989, Ser. No. 352,305
Int. Cl.[5] G01B *11/16*
U.S. Cl. 356—32 **6 Claims**



1. A method for detecting the residual stress around a hole formed in a metal sheet specimen, the method comprising the steps of:

loading the specimen with a preselected force;

directing an incoming laser beam toward the hole in the specimen at a focal point aligned with the hole and immediately outside the specimen;

directing a beam reflected from the specimen toward a screen so that a caustic image is displayed thereon; and

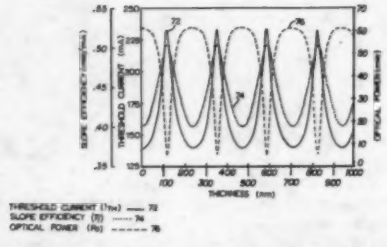
photographing the resulting caustic image on the screen, the image including a caustic tail related in length to a crack tail extending between the hole and a crack tip, in a generally radially outward direction;

wherein the geometry of the image is indicative of the residual stress in the vicinity of the hole.

4,953,974
OPTICAL MEASUREMENT OF THIN FILMS

William J. Fritz, Florissant, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 19, 1988, Ser. No. 286,297
Int. Cl.[5] G01N *21/41, 21/59;* G01B *11/06*
U.S. Cl. 356—128 **6 Claims**



1. A method to measure a property of a thin film of a fluid in real time comprising;

confining the fluid within an optically thin cavity of known thickness adjacent one output facet of an injection laser diode having certain operating parameters and material characteristics wherein the output from the facet passes through the cavity and illuminates associated photodetector means such that any solid wall acting to confine the fluid is optically transparent and has a thickness which is an even number of quarter wavelengths of the laser output beam passing therethrough,

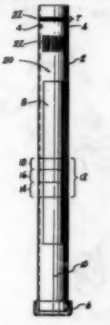
measuring the output power of the injection laser diode with the photodetector means, and

calculating the property of the thin film of a fluid as a function of the measured output power and the operating parameters and the material characteristics of the laser diode.

4,953,975
CORRECTION OF MATERIAL LAYER VOLUME MEASUREMENTS

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 191 N. Cove Rd., Old Saybrook, Conn. 06475

Filed Jan. 30, 1989, Ser. No. 303,125
Int. Cl.[5] G01N *21/07*
U.S. Cl. 356—246 **8 Claims**



1. A material sampling assembly comprising: a transparent tube for holding a material sampling to be separated by centrifugation; a cylindrical float for placement in the tube when the sample is centrifuged; and means printed on the tube or float which provides an indication of the ratio of the square of the tube bore radius to the difference between the squares of the tube bore radius and the float radius.

4,953,976
GAS SPECIES MONITOR SYSTEM

Steven Adler-Golden, Newtonville; Neil Goldstein, Medford, and Fritz Bien, Concord, all of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed Mar. 20, 1989, Ser. No. 325,981
Int. Cl.[5] G01J *3/44;* G01N *21/65*
U.S. Cl. 356—301 **6 Claims**

1. A gas species monitor system comprising:

a sample volume for receiving a gas to be monitored;

an external, independent laser source:

means for directing the laser radiation to said volme;

a multipass optical cell, responsive to said means for directing, for multiplying the laser radiation intensity in the sample volume;

means for sensing the intensities of the laser radiation at said laser source and in said multipass optical cell after the beam of laser radiation has made predetermined number of reflections in said multipass optical cell through said sample volume;

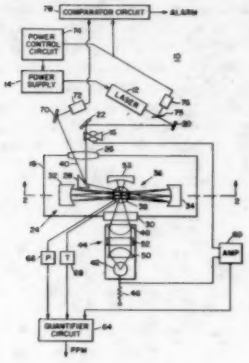
means for comparing said intensities of the laser radiation at said laser source and in said multipass cell to determine whether a system fault is present;

means, responsive to said means for sensing, for controlling the power output of said laser source to maintain a predetermined value of power output;

means for continuously flowing the gas to be monitored through the sample volume;

a narrow bandbass filter;

means for collecting more than a steradian of Raman scattered radiation from the sample in the volume and directing the collected radiation in parallel through said narrow bandpass filter; and



means, responsive to the parallel radiation from the filter, for detecting and quantifying scattered radiation representative of the concentration of the species in the gas sample being monitored.

4,953,977

ELECTROTHERMAL ATOMIZATION FURNACE

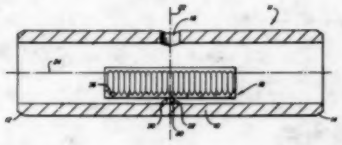
Rolf Tamm, Salem, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,884

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743286

Int. Cl.[5] G01N *21/74*

U.S. Cl. 356—312 **19 Claims**



1. An electrothermal atomization furnace comprising:

a tubular electrothermal furnace body adapted for passing a radiation beam therethrough, said furnace body having a centrally positioned lateral inlet aperture,

means for passing an electrical current through said furnace body to heat said furnace body sufficient to atomize a sample on a platform within said furnace body,

an elongated sample platform having a sample holding recess and being positioned centrally within said furnace body opposite said inlet aperture and integrally connected to said furnace body,

web means for integrally connecting said platform to said furnace body, said web means being configured and positioned to maintain a substantially uniform electrical potential thereacross to substantially prevent a heat-generating current flow through said platform when current flows through said furnace body and to sufficiently impede heat conduction from said furnace body to said platform so that sample on said platform is thermally atomized substantially by radiation from said furnace body,

said furnace body having a longitudinally axis and a longitudinal center plane containing said axis and extending through said inlet aperture,

said web means comprising a single web extending between said furnace body and said platform and positioned in said center plane,

said platform having a hollow, generally semicylindrical shape and disposed between said inlet aperture and said web and symmetrically arranged relative to said center plane,

said means for passing an electrical current comprising first and second electrical contacts disposed laterally on said furnace body so that electrical current flows in a circumferential direction through said furnace body and said web being positioned so that all points on said web have substantially the same electrical potential,

first and second generally semicylindrical hollow body members being oppositely disposed and extending around said furnace body to form a slot therebetween with said center plane extending through said slot, said first body member having a first web portion extending perpendicular to said center plane and connecting said first body member to said furnace body, said second body member having a second web portion extending perpendicular to said center plane and connecting said second body member to said furnace body

said first contact being integral with said first body member and having a longitudinal axis extending perpendicular to said center plane, and

said second contact being integral with said second body member and having a longitudinal axis extending perpendicular to said center plane.

4,953,978

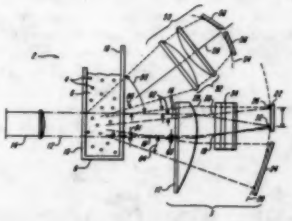
PARTICLE SIZE ANALYSIS UTILIZING POLARIZATION INTENSITY DIFFERENTIAL SCATTERING

Steven E. Bott, Conway, and W. Howard Hart, Amherst, both of Mass., assignors to Coulter Electronics of New England, Inc., Amherst, Mass.

Filed Mar. 3, 1989, Ser. No. 319,480

Int. Cl.[5] G01N *15/02, 21/53*

U.S. Cl. 356—336 **5 Claims**



1. A system for measuring the size of particles suspended in a sample cell, comprising

illumination means for illuminating the sample cell along a first interrogating axis with one or more interrogating light beams, each characterized by a selected wavelength and including at least a first interrogating component having a polarization parallel to a scattering plane and a second interrogating component having a polarization perpendicular to said scattering plane,

photodetector means for detecting light scattered by said suspended particles for at least one selected wavelength and in a scattering plane at at least two selected scattering angles,

said photodetector means including means for generating a first intensity signal representative of an intensity of scat-

tered light corresponding to said first interrogating component,

said photodetector means including means for generating a second intensity signal representative of an intensity of scattered light corresponding to said second interrogating component, and

intensity differential processing means, coupled to said photodetector means, for generating a signal representative of the particle size distribution in said sample cell for at least one selected wavelength, said intensity differential processing means including means for generating a difference signal representative of the difference of said first and second intensity signals, said intensity differential processing means including calculation means for generating a resultant signal representative of a selected arithmetic transformation of said difference signal.

4,953,979

OPTICAL SYSTEM FOR SIGNAL LIGHT DETECTION IN A FLOW PARTICLE ANALYSIS APPARATUS

Shinichi Hirako, Kyoto, Japan, assignor to Omron Tateisi Electronics Company, Kyoto, Japan

Filed Nov. 15, 1988, Ser. No. 271,575
Claims priority, application Japan, Nov. 18, 1987, 62-291465
Int. Cl.[5] G01N *21/53*
U.S. Cl. 356—338 **5 Claims**

1. An optical system for signal light detection of a flow particle comprising:

means for directing light onto flow particles flowing in a flow cell; a condenser lens for condensing signal light emitted from the flow particles, a photodetector for receiving signal light exiting from said condenser lens, an aperture provided between said condenser lens and said photodetector for removing undesired light, and a convergence-type collimating lens provided between said aperture and said photodetector, said aperture being disposed at a front focal position of said convergence-type collimating lens, and an exit pupil of said condenser lens and a photosensitive surface of said photodetector being located respectively at conjugate points of said convergence-type collimating lens, whereby the photosensitive surface of said photodetector is located at the image of said exit pupil.

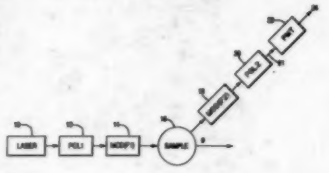
4,953,980

PARTICLE IDENTIFYING APPARATUS

Burton DeVolk, Albuquerque; Fritz Allen, Corrales; Cathy D. Newman, and Robert J. Frantz, both of Albuquerque, all of N. Mex., assignors to Mesa Diagnostics, Inc., Albuquerque, N. Mex.

Filed Aug. 5, 1988, Ser. No. 228,741
Int. Cl.[5] G01N *21/21, 21/49*
U.S. Cl. 356—338 **10 Claims**

1. In apparatus for identifying a particulate substance in suspension based on the radiation scattering behavior of the substance, which apparatus includes means for generating a collimated beam of substantially monochromatic radiation which is linearly polarized along a first polarization axis transverse to the beam axis, first modulation means disposed in the path of the linearly polarized beam for effecting polarization modulation of the linearly polarized beam about a first dynamic axis at a first modulation frequency; means for holding a sample of the particulate substance in the path of the modulated beam emerging from said first modulation means so that radiation is scattered by the substance in a scattering plane, second modulation means disposed in the scattering plane for receiving radiation scattered by the sample and effecting polarization modulation of the scattered radiation about a second dynamic axis at a second modulation frequency; polarizing means disposed in the scattering plane for receiving scattered radiation from said second modulation means and having a second polarization axis for passing that portion of the scattered radiation which is parallel to the second polarization axis; detector means connected to receive radiation passed by said polarizing means and to produce a signal corresponding to the intensity of that radiation; and signal processing means connected to receive the signal for producing an indication of the



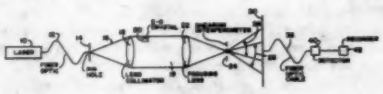
intensity of the radiation received by the detector means at frequencies corresponding to selected elements of a Mueller matrix which characterizes the radiation scattering properties of the substance, the Mueller matrix being a 4×4 matrix composed of element fiji, where i is the row number and j is the column number of each element, the improvement wherein aid signal processing means are operative for only deriving indications: of the intensity of the received radiation corresponding to element f11 of the Mueller matrix; and of three selected frequency components of the received radiation, which components have amplitudes corresponding to elements f12, f34 and f44 of the Mueller matrix, and said polarization axes and dynamic axes are oriented for causing the radiation arriving at said detector means to contain said selected frequency components.

4,953,981

LATERAL-SHEARING ELECTRO-OPTIC FIELD SENSOR

Walter L. Hales, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1989, Ser. No. 389,136
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—353 **3 Claims**



1. A lateral-shearing electro-optic field sensor comprising a coherent light source, means for diffracting said light into a spacially coherent beam, a collimating lens mounted for receiving said spacially coherent beam and converting said beam to an emerging collimating beam, an electro-optic crystal mounted in a minor portion of said collimated beam, a focusing lens mounted at a distance greater than its focal length from said electro-optic crystal, said focusing lens focusing said collimated beam to a point focus, a lateral-shearing interferometer mounted at said focus point and producing an amplitude division of the focused light at said focus point to produce two overlapping beams that propagate at slightly different angles, and presenting said two overlapping beams on an image plane

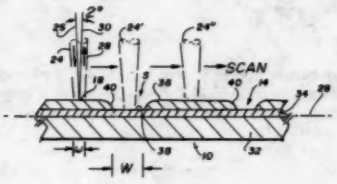
that is positioned such that it and said electro-optic crystal are at conjugate foci of said focusing lens.

4,953,982

METHOD AND APPARATUS FOR ENDPOINT DETECTION IN A SEMICONDUCTOR WAFER ETCHING SYSTEM

Peter Ebbing, Los Altos, and Manoocher Birang, both of Santa Clara, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jul. 20, 1988, Ser. No. 221,979
Int. Cl.[5] G01B 9/02
U.S. Cl. 356—357 **16 Claims**



1. A method for endpoint detection in a semiconductor wafer etching system comprising the steps of:

making multiple scans of a semiconductor wafer surface along a substantially identical path with a narrowly focussed beam of radiant energy and detecting a reflected portion of said beam;

firstly analyzing said reflected portion to determine a preferred parking spot on a preferred flat area of said surface, said preferred flat area having a minimum transverse dimension greater than a spot size of said beam, said step of firstly analyzing said reflected portion including analyzing a region of a first scan and a corresponding region of a second scan;

parking said beam at said preferred spot; and

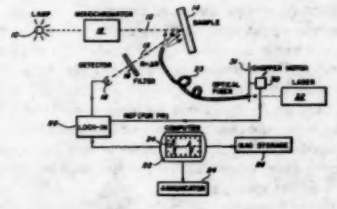
secondly analyzing said reflected portion of said beam to determine when said preferred flat area has been etched through.

4,953,983

NON-DESTRUCTIVELY MEASURING LOCAL CARRIER CONCENTRATION AND GAP ENERGY IN A SEMICONDUCTOR

Nicholas Bottka, 5642 Mt. Burnside, Burke, Va. 22015; D. Kurt Gaskill, 3187 Lawson Hill Pl., Alexandria, Va. 22310, and Robert Glosser, 2909 Deep Valley Trail, Plano, Tex. 75075

Filed Mar. 25, 1988, Ser. No. 172,921
Int. Cl.[5] G01N 21/55, 21/84
U.S. Cl. 356—445 **14 Claims**



1. A method for measuring local carrier concentration in a preselected portion of a semiconductor, said method comprising steps for:

illuminating said preselected portion of said semiconductor with a substantially monochromatic light of a preselected photon energy;

measuring change in photo reflectance of said portion of said semiconductor responsive to said illuminating by said light of said preselected photon energy;

recording said change in photo reflectance;

repeating said steps for illuminating, measuring, and recording, each said repeating of said steps for illuminating, measuring, and recording being done with a substantially monochromatic light of a different preselected photon energy;

said repeating of said steps being done a sufficient number of times to permit location of at least two Franz-Keldysh peaks, and identification of the respective photon energies and peak indices n corresponding to each of said at least two Franz-Keldysh peaks;

recording each of said respective photon energies and peak indices n;

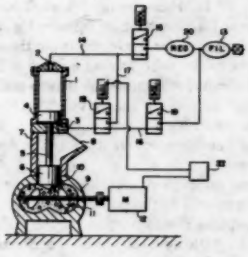
using said each of said respective photon energies and peak indices n to calculate said local carrier concentration.

4,953,984

OVERLOAD PREVENTING SYSTEM FOR KNEADING MACHINE

Tsuyoshi Miyoshi, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 24, 1989, Ser. No. 383,623
Int. Cl.[5] B29B 1/06
U.S. Cl. 366—76 **6 Claims**



1. In a kneading machine having a cylinder provided in upper and lower positions with upper and lower ports for inflow and outflow of compressed fluid, a piston slidably fitted in the cylinder and having a weight connected to the underside thereof, a case on which is erected the cylinder in a position where an upper opening of said case is closed and opened by said weight, and kneader blades disposed within said case, an overload preventing system including:

an upper pipe extending from said upper port to a compressed fluid feed source, said upper pipe having means for selectively cutting off communication between said upper port and said compressed fluid feed source, said upper pipe also having means for selectively opening said upper port to the atmosphere;

a lower pipe extending from said lower port to a compressed fluid feed source, said lower pipe having means for selectively cutting off communication between said lower port and said compressed fluid feed source, said lower pipe also having means for selectively opening said lower port to the atmosphere;

connecting means for selectively connecting said upper port to said lower port such that compressed fluid in said upper port can flow into said lower port;

means for detecting a load imposed on a drive means for driving said kneader blades; and

means for operating said connecting means for selectively connecting said upper port to said lower port in accor-

dance with the load detected by said load detecting means,

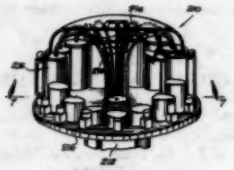
whereby compressed fluid can be transferred from said upper port to said lower port when an overload is detected so that a force applied by said weight to said casing is reduced.

4,953,985

MIXING STRUCTURE FOR PAINT COLORANT IN A DISPENSING APPARATUS

William A. Miller, Buffalo Grove, Ill., assignor to Fluid Management Limited Partnership, Wheeling, Ill.

Filed Jul. 17, 1989, Ser. No. 381,046
Int. Cl.[5] B01F *7/16*
U.S. Cl. 366—244 **28 Claims**



1. In a paint colorant dispenser and mixer apparatus including a plurality of colorant containers each having an open upper end, means for mounting an agitator for rotation within each colorant container for mixing colorant therein, a plurality of agitator drive cables each having a drive end and a driven end, and drive means for rotating the driven ends of the cables to thereby effect rotation of the drive ends of the cables, the improvement comprising:

a plurality of container covers to close the open ends of the containers;

joining means on each cover and container for releasably joining the covers to the containers;

rotatable coupling means carried on the covers for releasably engaging the agitator within a container enclosed by the cover and for disengaging the agitator when the cover is withdrawn from said container, and said rotatable coupling means further comprising connector means for connecting the drive ends of the cables to the rotatable coupling means on the covers to impart rotation to the rotatable coupling means; and

biasing means for biasing the covers against the containers to maintain the closure thereof and to maintain engagement of the rotatable coupling means with their associated agitators when said agitators are rotatably driven within said containers.

4,953,986

AIR/SEA TEMPERATURE PROBE

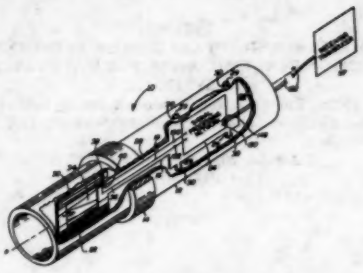
Jack R. Olson; Herbert V. Hitney, both of San Diego; Richard A. Paulus, La Mesa, and Kenneth D. Anderson, Lemon Grove, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 27, 1989, Ser. No. 348,740
Int. Cl.[5] G01K *13/00, 1/14*
U.S. Cl. 374—136 **37 Claims**

1. A probe for measuring the temperatures of air and water at the air/sea interface, comprising:

a tubular, electrically nonconductive, solar radiation shield having first and second open ends for permitting said air and water to flow therethrough;

first means positioned within said shield for detecting said temperatures; and



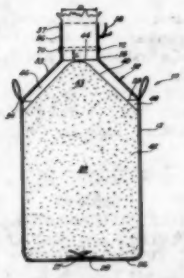
second means operably coupled to said first means and mounted to said shield for providing a first output functionally related to said detected temperatures.

4,953,987

CONE TOP TO FLAT TOP FABRIC TRANSPORT BAG

Daniel R. Schnaars, 204 "A" Easy St., Lafayette, La. 70506

Filed Dec. 6, 1988, Ser. No. 287,262
Int. Cl.[5] B65D *33/16*
U.S. Cl. 383—67 **10 Claims**



1. A. fabric bag for storage of dry bulk material, the bag comprising:

(a) four side walls, and a bottom portion, for defining a bulk containing space therewithin;

(b) a top portion, secured to the four side walls, the top portion forming a truncated cone;

(c) an inlet spout secured to an upper end of the truncated cone, he inlet spout having a diameter (D) and defining an opening for introducing bulk into the bulk containing space of the bag;

(d) a channel formed along an outer peripheral wall of the inlet spout, the channel positioned a distance above a point of contact between the inlet spout and the upper end of the truncated cone which is less than half the diameter (D) of the inlet spout; and

(e) a tie cord secured within the channel, so that constriction of the tie cord to form an iris closure of the inlet spout also draws fabric of the truncated cone inwardly so that when the bag is filled with bulk the truncated cone is laid substantially flat against the bulk upon full closure of the inlet spout.

4,953,988

LINEAR GUIDE APPARATUS WITH CLAMP DEVICE

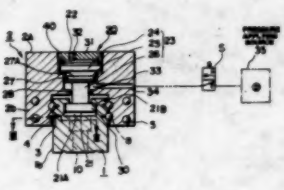
Toru Tsukada, Gumma, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1989, Ser. No. 432,481

Claims priority, application Japan, Nov. 9, 1988, 63-146086[U]

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—8 5 Claims



1. In a linear guide apparatus with a clamp device comprising an axially extended guide rail having a square cross section and rolling member rolling grooves respectively formed in both lateral side surfaces, a slider movably and straddlingly mounted on said guide rail and having rolling member rolling grooves respectively formed in the inner surfaces of both side walls to respectively oppose the rolling member rolling grooves of said guide rail, and a plurality of rolling members rollably inserted in opposing ones of the rolling member rolling grooves of said guide rail and said slider, the improvement comprising:

a groove formed in an upper surface of said guide rail extending over the whole length thereof;

a cylinder bore formed in said slider extending upwardly from an inner surface to oppose said groove in said guide rail;

a top and a piston integrally formed together, said top engaging said groove of said guide rail and prevented from slipping out of said groove, said piston engaging said cylinder bore;

elastic energizing means for energizing said piston in a non-clamp direction to separate said top from a groove surface of said groove of said guide rail and to bring said guide rail and said slider into a non-clamp condition; and

fluid pressure applying means for applying a fluid pressure to said piston to energize said piston in a clamp direction against said elastic energizing means to make said top held by the groove surface of said groove of said slider in a clamp condition.

4,953,989

GAS BEARING PART, AND DEVICE PROVIDED WITH SUCH A GAS BEARING PART

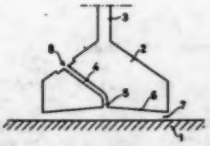
Carel W. J. Hooykaas, Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Rotterdam, Netherlands

Filed Jan. 26, 1989, Ser. No. 302,570

Claims priority, application Netherlands, Feb. 22, 1988, 8800440

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—12 11 Claims



1. Gas bearing part provided with gas supply means which open out into a recessed working surface of said gas bearing part which can be placed opposite a carrier plate to permit formation of a gas bearing relative to the carrier plate, wherein said gas bearing part is a completely solid body having a working surface defined by an essentially conical recess, the top of the conical recess being essentially in the center of the surface, the gas supply means opening out substantially and exclusively into the top of the conical recess and wherein the roughness of the working surface is less than 10 ru.

4,953,990

OVEREXTENSIBLE, THREE-PIECE TELESCOPIC GUIDE

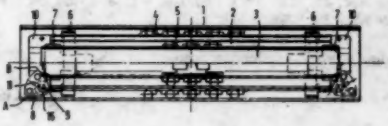
Hendricus T. Wojcik, Eijsden, Netherlands, assignor to Thomas Regout N.V., Maastricht, Netherlands

Filed Aug. 14, 1989, Ser. No. 393,287

Claims priority, application Netherlands, Aug. 16, 1988, 8802030

Int. Cl.[5] A47B *88/00*

U.S. Cl. 384—18 6 Claims



1. An overextensible, three-piece telescopic guide comprising an outer or housing bar, a middle bar and one inner or drawer bar, which bars are slidable relatively to each other by means of two ball cages respectively mounted between the housing bar and the middle bar and between the middle bar and the drawer bar, there being provided end stops engaging with the ball cages for locking the bars in the extended position relatively to each other in the direction of extension, characterized in that at both ends of the two ball cages (4,5) loose sliding buffers (6,7) are mounted which are slidable within the corresponding bars and lock the middle and the drawer bars (2,3) in both extended end positions by means of end stops (12,14).

4,953,991

PULL-OUT GUIDE ASSEMBLY FOR DRAWERS

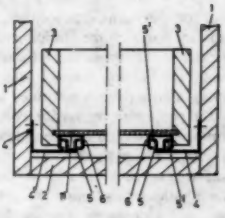
Erich Röck, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Dec. 28, 1989, Ser. No. 458,371

Claims priority, application Austria, Jan. 9, 1989, A 30/89

Int. Cl.[5] F16C *29/00*

U.S. Cl. 384—19 5 Claims



1. A pull-out guide assembly for drawers, comprising, on each side of the drawer, a pull-out rail on the side of the drawer and a supporting rail on the side of the body, and load-transmitting slides or rollers mounted in a carriage, the supporting rails in longitudinal direction being divided into a mounting member fastenable to the furniture side wall and a running member,

and the mounting member being adapted to be coupled to the running member, a horizontal flange of the running member being at the rear end pushed below a hook bent out from a horizontal flange of the mounting member, and at the front end of the supporting rail a positioning pin for the running member being provided, characterized in that said positioning pin is a hook, and that a slide is mounted at said mounting member, said slide pressing said running member in the push-in direction of the drawer towards the rear end and underneath a projection of said positioning pin.

4,953,992

INDUSTRIAL ROBOT SWIVEL SHAFT APPARATUS

Nobutoshi Torii, Hachioji, and Kazuhisa Otsuka, Hino, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

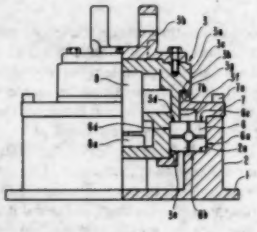
PCT No. PCT/JP87/00849, § 371 Date Apr. 21, 1988, § 102(e) Date Apr. 21, 1988, PCT Pub. No. WO88/03464, PCT Pub. Date May 19, 1988

PCT Filed Nov. 4, 1987, Ser. No. 210,515

Claims priority, application Japan, Nov. 13, 1986, 61-270619

Int. Cl.[5] F16C *33/78*

U.S. Cl. 384—607 **3 Claims**



1. An industrial robot rotation shaft apparatus comprising:

a stationary support having an upper end and a lower end for supporting an industrial robot,

a rotatable support rotatably connected to the stationary support for rotating thereon with a gap formed therebetween,

bearing means coupled to the stationary support and the rotatable support in the gap therebetween to facilitate rotation of the rotatable support relative to the stationary support,

said rotatable support having an outer cylindrical surface and a skirt portion extending downwardly from the outer cylindrical surface towards the stationary support; and

a holder connected to the upper end of the stationary support for holding the bearing means to the stationary support and having a collar portion formed inwardly of the skirt portion and projecting upwardly from the holder, the collar portion being disposed in a complementary, sealing relationship with the skirt portion,

wherein the rotatable support has a lower, first outer diameter portion, a middle, second outer diameter portion, and a third, upper outer diameter portion, the skirt portion being formed by an annular groove which extends upwardly between the second and third diameter portions, the bearing means supporting the rotatable support at a shoulder formed between the first and second diameter portions, and the collar portion of the holder fitting into the annular groove of the rotatable support so as to overlap with the skirt portion.

4,953,993

CAGED COMB FOR A LARGE ROLLER BEARING

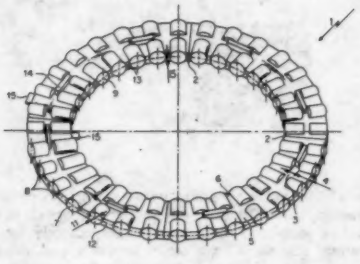
Diethelm Bahr, Wermelskirchen, Fed. Rep. of Germany, assignor to Hoesch AG, Dortmund, Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 378,247

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824279

Int. Cl.[5] F16C *33/49*

U.S. Cl. 384—623 **12 Claims**



1. A comb-caged thrust bearing comprising circular-shaped segments for an axial two-row roller race carrying rollers in a large centrally-open roller bearing; said segments forming a web with radially oppositely-lying comb stages for holding and guiding said rollers; said comb stages of said web enclosing said rollers along three sides of said rollers, said rollers being enclosed by said comb stages along oppositely-lying axial lines on the periphery of said rollers, said rollers having one end enclosed by said comb stages substantially along a diameter of said one end of said rollers, said diameter having ends connected to said axial lines, said rollers having another end that is free from being enclosed by said comb stages.

4,953,994

THERMAL PRINTER WITH RECIPROCAL PAPER FEED CONTROL

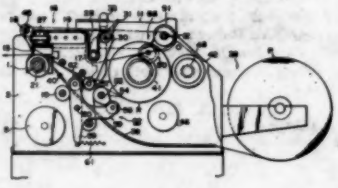
Tsugio Shiozaki, Susono; Satoshi Kitahara, Mishima; Osamu Koizumi, Shizuoka, and Ikuzo Sugiura, Sagamihara, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,762

Claims priority, application Japan, Oct. 14, 1987, 62-157117; May 6, 1988, 63-59824

Int. Cl.[5] B41J *3/02*

U.S. Cl. 400—120 **9 Claims**



1. A thermal printer comprising:

a platen (1);

platen supporting means (2) for rotatably supporting the platen;

platen drive means (3, 5, 7) for rotating the platen;

a thermal head (15) for printing on a paper sheet, the paper sheet being arranged in a region between the platen and the thermal head;

head drive means (11, 16) for selectively moving the thermal

head between a first position in which the terminal head is pressed against the platen, and a second position in which the thermal head is disengaged from the platen;

sheet transportation means (9, 10, 62) for selectively feeding a paper sheet in a first direction, such that the paper sheet is fed to the region between the platen and the thermal head, and in a second direction such that the paper sheet is returned from the region between the platen and the thermal head, when the thermal head is in the second position; and

detecting means (40) for detecting the passing of the paper sheet moving in the second direction between the platen and the sheet transportation means and for driving the sheet transportation means to transport the paper sheet in the first direction.

4,953,995

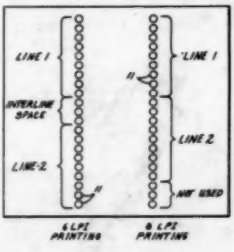
DOT MATRIX PRINTER AND METHOD FOR PRINTING MULTIPLE LINES AT DIFFERENT LINE SPACINGS

Louis Sims; Fred LeFriec, both of Spokane, Wash.; Joseph Dubner, Hayden Lake, Id., and Brian Peavey, Spokane, Wash., assignors to Output Technology Corporation, Spokane, Wash.

Continuation of Ser. No. 924,352, Oct. 29, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 185,452

Int. Cl.[5] B41J *3/10*

U.S. Cl. 400—121 **23 Claims**



1. A dot matrix printer for simultaneously printing successive groups of multiple lines of characters on a recording medium within dot matrices of a common predetermined character height at a selected line spacing of one-sixth inch or one-eighth inch, while maintaining the predetermined character height constant independently of the selected line spacing, comprising:

a printhead having an uninterrupted array of functionally identical print elements arranged in positions for individually marking single dots within a column presentation on a recording medium during simultaneous printing of a group of two or more lines of characters generated within dot matrices of a predetermined constant character height, the number of print elements being greater than twice the number of dots in the height of each dot matrix;

wherein the print elements are evenly spaced at a uniform print element pitch related to a "whole fraction" multiple of the difference between the one-sixth inch and one-eighth inch line spacing;

memory means for storing columnar data for two or more lines of characters;

control means for directing columnar data from the memory means to different selected sets of print elements to vary the character to character vertical spacing between the multiple lines in each group of lines while maintaining the character height constant independently of whether the one-sixth inch or one-eighth inch line spacing is chosen; and

means for advancing the recording medium, after printing of each group of multiple lines, by a distance that will space the successive groups of multiple lines by the selected character to character vertical line spacing with each group.

4,953,996

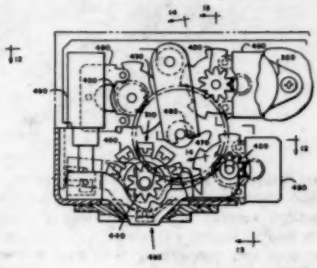
PRINTWHEEL SETTING DEVICE FOR A POSTAGE METER

Gilbert N. Riley, Wilton; Richard S. Holodnak, Stratford; Richard A. Malin, and Arno Muller, both of Westport, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 114,358, Oct. 27, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 376,175

Int. Cl.[5] B41J *1/34*

U.S. Cl. 400—162.2 **10 Claims**



1. A printwheel setting device for positioning a printwheel of a postage meter comprising:

a printwheel having a plurality of printing characters about the periphery thereof;

a motor;

a gear train drivingly connecting said motor to said printwheel;

said gear train including at least one gear such that a plurality of positions of said at least one gear correspond respectively to a printing position of each of the plurality of printing characters on said printwheel;

means for determining the path of rotation of said at least one gear tp a nearest one of said plurality of positions to place said at least one gear into a position wherein a desired character on said printwheel is in the printing position; and

means for operating said motor to move said at least one gear wheel to said position.

4,953,997

TRACTOR UNITS FOR PUSH-PULL PRINTER

Kazumi Hasegawa, Tokyo; Hiroshi Ikeda, Tokorozawa, and Wataru Ito, Koganei, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 91,129, Aug. 31, 1987, abandoned. This application May 2, 1989, Ser. No. 348,110

Claims priority, application Japan, Aug. 30, 1986, 61-202699

Int. Cl.[5] B41J *11/28*

U.S. Cl. 400—616.3 **8 Claims**

1. A push-pull printer, comprising:

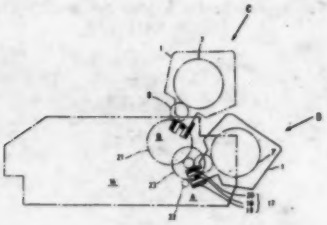
a printer body having push and pull feed positions;

at least one tractor unit;

first mounting means having a first mounting portion secured to said push feed position of said printer body, said first mounting means being arranged to detachably support a corresponding one of said at least one tractor unit at said push feed position; and

second mounting means having a second mounting portion secured to said pull feed position of said printer body, said second mounting means being arranged to detachably support a corresponding one of said at least one tractor

unit at said pull feed position, wherein each of said at least one tractor unit is provided at its opposite end portions with a pair of frames; said first mounting means having a first pair of projections secured at said push feed position of said printer body, a first engaging pin secured between said projections and cooperating with said first pair of projections to form said first mounting portion, and a first fork-like mounting portion formed in a lower portion of each of the pair of frames of the tractor unit associated with said first mounting means and detachably supported



by said first pair of projections and said first engaging pin; and said second mounting means having a second pair of projections secured to said pull feed position of said printer body, a second engaging pin secured between said projections and cooperating with said second pair of projections to form said second mounting portion, and a second fork-like mounting portion formed in a lower portion of each of the pair of frames of the tractor unit associated with said second mounting means and detachably supported by said second pair of projections and said second engaging pin.

4,953,998

POLISHING GLOVE APPARATUS

Stone W. McCartherens, 916 Cedar Ave., Albany, Ga. 31701

Filed Jun. 30, 1989, Ser. No. 374,029

Int. Cl.[5] A46B *5/04*; **A47K** *7/02*; **A47L** *1/08, 13/18*

U.S. Cl. 401—7 **1 Claim**

1. A glove apparatus for applying polish wherein the glove apparatus consists of:

a glove unit including a waterproof hand covering member including a wrist covering portion, a finger covering portion, a thumb covering portion, a first plurality of cooperating releasable securing means and a web formed between the thumb covering portion and the finger covering portion;

a reservoir unit for holding a liquid wherein second releasable securing means releasably secures the reservoir unit with the glove unit, said reservoir unit comprises a fluid reservoir member;

a fluid delivery unit including a fluid conduit having an inlet and an outlet and a fluid control member operatively connected to the fluid reservoir member wherein the fluid control member includes an outlet in communication with the inlet of the fluid conduit, the fluid control member controls the delivery of the contents of the fluid reservoir member to the fluid conduit; and,

a polishing cloth unit comprising a layer of absorbent material which covers at least the bottom portion of the glove unit wherein the layer of absorbent material is provided with a second plurality of releasable cooperating securing means for operably engaging said first plurality of cooperable releasable securing means for attaching the polishing cloth unit to the glove unit; and, wherein said second releasable securing means includes a plurality of straps for releasably yet captively engaging the reservoir unit to the glove unit and the fluid conduit outlet is connected to the web on the glove unit at a location spaced from the end of the web.

4,953,999

GOLF CLUB GRIP CLEANER

Joseph L. Rivers, Boston, Mass., assignor to Randr, Inc., Cambridge, Mass.

Filed Aug. 8, 1988, Ser. No. 229,638

Int. Cl.[5] A47L *13/17, 25/00*

U.S. Cl. 401—9 **8 Claims**

1. A hand-held portable device for cleaning a golf club grip comprising:

a generally tubular, elongate housing open at its ends and having a slot extending along its length from one end to the other end, the slot communicating with the open ends;

cleaner pad means mounted within the housing and having a longitudinally extending slot and open ends, said slot and open ends being aligned with the slot and open ends of the housing, the cleaner pad means being generally U-shaped in transverse cross-section, the cleaner pad means including a wetting pad and a flexible, resilient backing sheet to which the wetting pad is mounted;

the ends of the housing having flanges for engagement with and containment of opposed ends of the backing sheet;

means for precluding rotation of the cleaner pad means about a longitudinally extending axis comprising flanges extending along the edges of the longitudinally extending slot for engaging the backing sheet of the pad assembly;

means carried by the housing for wetting the wetting pad including a liquid reservoir carried by the housing and pump means for pumping liquid from the reservoir onto the wetting pad;

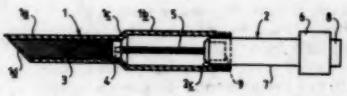
whereby a golf club grip may be inserted into the cleaner pad means transversely through the slots in the housing and the cleaner pad means and may be substantially encompassed by the cleaner pad means, and may then be drawn longitudinally whereby the cleaner pad means may effect a cleaning action on the grip.

4,954,000

REFILLABLE DISPENSER INCLUDING A TRANSLATABLE PLUNGER

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Apr. 14, 1989, Ser. No. 338,226
Claims priority, application France, Apr. 15, 1988, 88 05026
Int. Cl.[5] A45D 40/06
U.S. Cl. 401—68 11 Claims



1. A dispenser of a product (3) contained in a cylindrical reservoir (1) in which said product (3) is disposed between the dispensing opening (1*d*) and a plunger (4) displaceable in translation in the reservoir (1), the plunger (4) being mounted at the end of a threaded rod (5) which cooperates with a fixed nut (9) supported by a support (7) integrally joined with the reservoir (1), the threaded rod (5) being displaceable in rotation incrementally by means of a mechanism also supported by said support (7), this movement being initiated by the action of the user upon a displaceable maneuvering device (8) supported by the support (7), in order to obtain the translation of the plunger (4) and the dispensing of the product (3)

the said dispenser comprising two sub-assemblies, the first sub-assembly including the mechanism, the threaded rod (5), the nut (9), the maneuvering device (8), the support (7) and the plunger (4), the second sub-assembly being the reservoir (1), and

the first sub-assembly being joined in a removable manner to the second sub-assembly by connecting means (6);

the nut (9) that cooperates with the threaded rod (5) is slit along at least one diametrical plane over the entire length of its threaded hole (11), the sectors of the nut being held together by a flexible zone (14) which assures the fixation of the nut (9) on the support (7);

the reservoir (1) includes a frustoconical surface (1*c*), which comes to be pressed against a corresponding frustoconical surface (2*c*) of the nut (9), when the movable reservoir (1) is joined with the support (7) to assure the pinching of the sectors of the nut about the threaded rod (5) driven by the mechanism.

4,954,001

MULTI-PURPOSE CLEANING DEVICE, IN PARTICULAR FOR VEHICLE WINDOWS AND THE LIKE

Alain E. Billat, 49 avenue de Gouvieux, 60260 Lamorlaye, Oise, France

Filed Sep. 26, 1989, Ser. No. 412,663
Int. Cl.[5] A47L 13/26, 13/22
U.S. Cl. 401—139 7 Claims

1. A multi-purpose cleaning device, in particular for vehicle windows, comprising:

a head that includes a portion on which is disposed a wiper blade, with said head having an underneath part;

a spongy body that is supported on said underneath part of said head;

a stirrup that is disposed on said head and includes at least one scraping rib;

a handle that carries said head and contains a treatment agent;

trigger means disposed on said handle for dispensing said treatment agent;

said head and said handle being an assembly of two complementary half shells, one of which forms a cradle for housing spraying means of a flask that is accommodated in said handle and contains said treatment agent;

a head portion of one of said half shells is provided with an aperture that has edges that form a retaining means for a support means for said spongy body; and

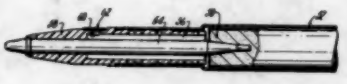
said support means comprises a substantially U-shaped median portion having sides that are connected via hinge means to respective wings that are each provided with studs that cooperate with openings of said support means to fix said spongy body thereon.

4,954,002

WRITING INSTRUMENT WITH MEMBRANE VENT AND THEIR MANUFACTURE

Philip Wallis, Newhaven, United Kingdom; Robert E. Burkhalter, and Thomas D. Hall, both of Janesville, Wis., assignors to Parker Pen (Benelux) B.V., Breda, Netherlands

Continuation of Ser. No. 474,523, Mar. 11, 1983, abandoned.
This application Sep. 17, 1985, Ser. No. 776,095
Claims priority, application United Kingdom, Mar. 16, 1982, 8207675
Int. Cl.[5] B43K 7/00, 5/00
U.S. Cl. 401—217 21 Claims



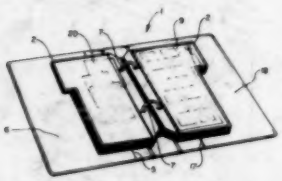
1. A writing instrument comprising an ink reservoir and an air hole, the air hole being spanned by barrier means, formed as a porous non-absorbent ink repellent membrane of substantially uniform pore size comprising a membrane formed from microfibers fixed together at their intersections, non-porously sealed along its entire periphery to the wall of the hole, for allowing the macroscopic flow of air therethrough in both directions while preventing the escape of ink therethrough and therearound.

4,954,003

COUPON ORGANIZER

Patrick A. Shea, 736 NE. Capital Blvd., Salt Lake City, Utah 84103

Filed Oct. 30, 1989, Ser. No. 428,065
Int. Cl.[5] B42F 13/00
U.S. Cl. 402—079 20 Claims



19. A coupon organizer comprising a plurality of leaves and a means for holding said leaves;

wherein each of said leaves comprises a coupon pocket on one face of the leaf and an aisle card pocket on the opposite face of the leaf;

wherein said coupon pocket can be used to hold coupons;

wherein each of said leaves further comprises an aisle card held in the aisle card pocket of the leaf;

wherein each of said aisle cards comprises a representation of at least one shopping aisle;

wherein each of said aisle cards can be used to record shopping items found in at least one aisle of a store; and

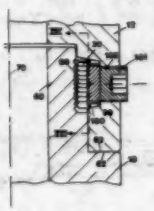
wherein each aisle card pocket is paired with a coupon pocket in such a manner that coupons in said coupon pocket and the aisle card in said aisle card pocket can be viewed together.

4,954,004

COUPLING DEVICE BETWEEN TWO ELEMENTS

Kurt H. A. E. Faber; Ute M. I. Faber, both of Sandviken; Knut Faber, Västerås; Inken A. H. Faber, Stockholm, and Andrea J. Faber, Sandviken, all of Sweden, assignors to AB Sandvik Coromant, Sandviken, Sweden

Division of Ser. No. 29,807, Mar. 25, 1987, Pat. No. 4,854,764. This application Jun. 15, 1989, Ser. No. 365,901
Claims priority, application Sweden, Mar. 25, 1986, 8601370; Nov. 26, 1986, 8605062
Int. Cl.[5] B25G 3/00; F16L 55/00
U.S. Cl. 403—13 7 Claims



1. In combination, first and second elements, and means coupling said first and second elements together;

said first element comprising an external circumferential surface containing a radially outwardly open generally circumferential first groove,

said second element comprising an internal circumferential surface sized to receive said external surface, said internal surface containing a radially inwardly open generally circumferential groove opposing said outwardly open first groove,

one of said grooves including a first end surface extending substantially perpendicularly relative to a longitudinal axis defined by said internal and external surfaces, the other of said grooves including a second end surface oriented at an acute angle relative to said longitudinal axis and spaced longitudinally from said first end surface, said second end surface facing toward a longitudinal direction which is opposite a longitudinal direction toward which said first end surface faces,

a split ring member disposed partially in said first groove and partially in said second groove, said ring member including a split region defined by mutually opposing first and second end walls, wherein relative movement of said end walls in a circumferential direction is opposed by an elastic bias of said ring, said ring member having a wedge-shaped cross-section formed by first and second circumferentially extending locking surfaces, said ring member being movable to a radially inwardly deformed position against said elastic bias wherein

said first locking surface is disposed parallel to, and in engagement with, said first end surface, said second locking surface disposed parallel to, and in engagement with, said second end surface, and

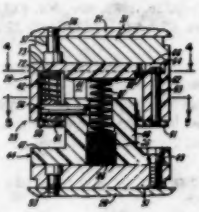
an actuating wedge including first and second wedge surfaces engaging said first and second end walls, respectively, by means of tooth-and-slot connections as said wedge surfaces are advanced progressively into engagement with said end walls, said tooth and slot connections being defined partially by said end walls and partially by said wedge surfaces and arranged to impart circumferential forces on said end walls for displacing said end walls toward one another in a manner deforming said ring member in a radial inward direction to said radially inwardly deformed position, against said elastic bias, for maintaining engagement between said first end surface and said first locking surface and between said second end surface and said second locking surface for preventing withdrawal of said first element from said second element.

4,954,005

SAFETY COUPLING DEVICE FOR ROBOTIC TOOLING

Harold E. Knasel, Springfield, and David A. Grigsby, Medway, both of Ohio, assignors to Process Equipment Company, Tipp City, Ohio

Continuation of Ser. No. 88,559, Aug. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 6,923, Jan. 26, 1987, Pat. No. 4,786,769, which is a continuation of Ser. No. 708,561, Mar. 6, 1985, Pat. No. 4,639,184. This application Jul. 25, 1989, Ser. No. 385,231
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[5] F16D 3/16; B25J 19/06, 17/02
U.S. Cl. 403—57 10 Claims



1. A robot assembly for moving tooling along a predetermined path, comprising an arm, means supporting said arm for predetermined vertical and horizontal movement, a safety coupling connecting said tooling to said arm to protect against

inadvertent damage to said robot and/or said tooling and to minimize down time of said robot, said coupling including a first support member, means for securing said first support member to said arm of said robot, a second support member, means for securing said second support member to said tooling, means connecting said first and second support members and providing for relative universal tilting movement between said first and second support member from a normal position where said first support member is aligned on an axis with said second support member, said connecting means including plurality of at least three pin members secured to one of said support members and spaced angularly about said axis, said pin members projecting outwardly in a spoke-like manner from said one support member with each said pin member having a radial axis and an outer end portion, the other said support member having means defining a corresponding plurality of cavities receiving said outer end portions of said pin members for relative movement within said cavities, seat members mounted on said other support member and forming a precision and positive stop surface within each of said cavities, stop members carried by said outer end portions of said pin members and engaging the corresponding said seat members when said first and second support member are axially aligned at said normal position, means for biasing said stop members against said seat members, said other support member being free to tilt relatively to each of said pin members and against said biasing means, said stop members being movable with said pin members within said cavities when said other support member tilts relative to said one support member, and control means responsive to said tilting movement for stopping the movement of said arm of said robot.

4,954,006

BALL JOINT

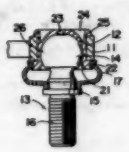
Kazumasa Suzuki; Masahiro Yamada, and Keiichiro Suzuki, all of Shizuoka, Japan, assignors to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 313,028

Claims priority, application Japan, Oct. 18, 1988, 63-135779[U]

Int. Cl.[5] F16D 1/12

U.S. Cl. 403—135 **9 Claims**



1. In a ball joint of the type that includes: a ball seat having an immovable closed side, an open inserting side, an outer wall portion and a ball stud having a ball portion mounted in said ball seat by insertion through said open side to provide a ball seat and ball stud subassembly; a housing having spaced apart opposite sides, a cylindrical bore passing therethrough from one of said sides to the other of said sides for receiving said outer wall portion and upper and lower opened edges on said housing sides, respectively, around said bore for holding said subassembly therein;

the improvement comprising:

said ball seat being formed out of a hard synthetic elastically deformable material;

said ball seat including an upper annular flange in spaced surrounding relation to said immovable closed side of said ball seat having a radially outward enlarged portion of a diameter that is, prior to insertion of said subassembly into said bore, greater than the inner diameter of said housing bore, said annular flange being engageable with said upper opened edge at said one side of said housing, and an inner circumferential side opposite said radially enlarged portion; and

an annular recess adjacent said inner circumferential side of said upper annular flange and spaced radially inward in opposed relation to said radially outward enlarged portion to provide a space adjacent said immovable closed side into which said upper annular flange can move to thus permit said upper annular flange enlarged portion to be elastically deformed without deforming said closed side, to a diameter at least equal to the inner diameter of said housing bore upon insertion of said subassembly therein.

4,954,007

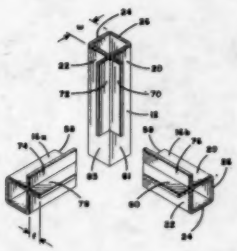
FRAMEWORK FOR CABINET STRUCTURE

Richard C. Pinney, 2110 Deodar St., Santa Ana, Calif. 92701

Filed May 8, 1989, Ser. No. 348,562

Int. Cl.[5] F16D 1/00

U.S. Cl. 403—172 **22 Claims**



1. A frame structure for a cabinet, comprising:

a plurality of structural members, each structural member comprising a substantially closed square shaped tube having four walls, four corners therebetween and two end portions, the four walls forming a hole therethrough, two of said four walls substantially adjacently abutting at one of said four corners but turning and extending outwardly therefrom to form first and second right angle flanges, said flanges being welded together at said one corner; and

means for securely attaching said plurality of structural members in a rigid corner arrangement.

4,954,008

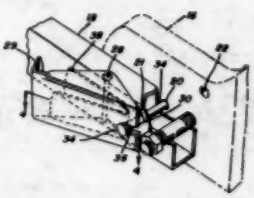
QUICK RELEASE MECHANISM AND SUPPORTING DEVICE HAVING A QUICK RELEASE MECHANISM

Grant D. Dicke, 1130 Franklin St., Downers Grove, Ill. 60515, and Jeffrey A. Williams, 610 Preston St., Bolingbrook, Ill. 60439

Filed Oct. 24, 1988, Ser. No. 261,707

Int. Cl.[5] F16B 1/00

U.S. Cl. 403—24 **21 Claims**



1. A quick release mechanism that secures a member to a structure, the mechanism comprising:

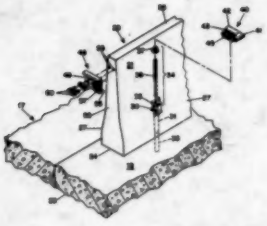
(a) a pin which slidably resides in an opening in the member;
(b) a lever arm attached to the member in a pivotable fashion, the lever arm having a handle end and an operating end, the operating end engaging a first end of the pin, the handle end having an apron wall that extends angularly towards the member to such a degree that the apron wall acts as a stop to the pivotable movement of the lever arm so that the movement of the pin out of the opening is limited; and
(c) a resilient means for forcing a second end of the pin into an opening in the structure, the resilient means being in a location that permits a force to be exerted on the underside of the lever arm's handle end.

4,954,009

ROAD BARRIER SYSTEMS AND METHODS

Roger C. Kellison, 8200 Boulevard East, North Bergen, N.J. 07047

Filed Sep. 30, 1988, Ser. No. 252,517
Int. Cl.[5] E01F *13/00, 15/00*
U.S. Cl. 404—6 **30 Claims**



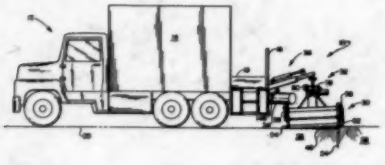
1. A barrier system for roadways includes a cast concrete barrier member having a side to extend parallel to a road traffic lane, at least one recess defined in the side, a generally vertical opening from the recess to the bottom of the barrier, adapted to receive a fastener therethrough affixing the barrier to a supporting surface on which it rests, a cap having a lower projecting portion conforming to the recess and adapted to fit therein, and an upper reflector support means for projection outward of the recess and locating a reflector outward of the recess beyond the surface of the barrier and facing generally horizontally along the barrier to visibly identify the location of the barrier by reflection of light from vehicle headlights.

4,954,010

TRANSVERSE-MOUNTED SLURRY SEALANT BOX ASSEMBLY

Darryl R. Montgomery, 3109 Amity Rd., Hilliard, Ohio, and David C. Raber, 10999 Converse Rd., Plain City, Ohio 43064

Filed Feb. 21, 1990, Ser. No. 484,163
Int. Cl.[5] E01C *19/22;* **E04G** *21/10*
U.S. Cl. 404—96 **22 Claims**



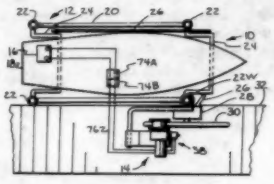
1. A sealant box assembly connectable to a vehicle and adapted to fill transverse roadway cracks, said roadway having a center line, which comprises:
a sealant box adapted to receive and dispense fluent material onto a roadway;
a boom assembly which carries said sealant box and has a drive for moving said sealant box along the length of said boom assembly, transversely of said roadway, one end of said boom assembly positioned for said sealant box to be located at the center line of said roadway while said vehicle is spaced apart therefrom;
a chute extending from said vehicle to said sealant box for filling said sealant box with fluent material; and
a mounting assembly connectable to the vehicle and pivotally connected to the boom assembly for its vertical movement.

4,954,011

POWERED METHOD AND APPARATUS FOR LIFTING A BOAT

Samuel H. Stenson, HCR 77, Pine River, Minn. 56474

Filed Aug. 1, 1988, Ser. No. 226,800
Int. Cl.[5] B63C *3/08*
U.S. Cl. 405—3 **21 Claims**



1. An electrically powerable boat lift assembly, comprising
(a) a mechanical boat lift having a fixed frame, a relatively movable boat lifting means movably mounted in said frame for lifting a boat in the lift up and out of the water, a drive movement interconnecting said frame to said lift means, and a lever for operating said drive movement;
(b) a tractive drive unit having a tractive frictional drive wheel, a DC electric motor, and a reduction drive connecting the motor to the drive wheel;
(c) mount means for movably mounting and supporting said drive unit on said frame with said drive wheel normally being in direct frictional engagement with and against said lever;
(d) self-operating biasing means for resiliently biasing said wheel directly against and into said frictional engagement with said lever;
(e) polarized connector means for both quick electrical connection and disconnection of said motor to a battery in the boat;
(f) electrical switch means connected to said connector means and to said motor for selectively running the motor in either direction, for selective raising and selective lowering the lifting means and the boat therein with the tractive drive motor being powerable by the boat battery.

4,954,012

METHOD OF COASTAL EROSION CONTROL USING MASSIVE SEA BLOCK SYSTEM

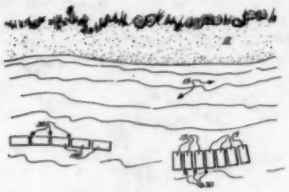
Jack L. Wheeler, P.O. Box 6092, Lake Charles, La. 70606

Continuation of Ser. No. 77,582, Jul. 24, 1987, Pat. No. 4,820,079. This application Apr. 10, 1989, Ser. No. 335,559
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] E02B *3/06*
U.S. Cl. 405—23 **15 Claims**

1. A method of coastal erosion control comprising the steps of:
a. transporting a plurality of massive and transportable hol-

low concretious blocks of concrete reinforced with steel to a coastal site where erosion is to be controlled;

b. arranging the massive blocks in an array that extends along the erosion site so that the blocks can dissipate wave action;



c. filling the hollow blocks with refuse until each of the blocks has a weight of at least twenty five (25) tons; and

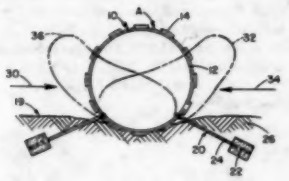
d. sealing each block after refuse is added so that wave action cannot scatter the refuse during heavy seas.

4,954,013

MEANS AND METHOD FOR STABILIZING SHORELINES

Bruce A. Lamberton, Strongsville, Ohio, assignor to Jacquelyn Lamberton, Strongsville, Ohio

Filed Jun. 12, 1987, Ser. No. 62,132
Int. Cl.[5] E02B *3/06*
U.S. Cl. 405—25 **14 Claims**



1. An offshore barrier module adapted to retard the wave-induced erosion of an adjacent shoreline comprising:

a porous barrier means for retarding the flow of water therepast to reduce the velocity thereof and to thereby promote the deposition of particulate matter at and adjacent to said barrier means, said barrier means comprising an elongated hollow substantially cylindrical body which includes flexible horizontal and vertical elements that extend around the periphery of said body and are secured to each other, and wherein said horizontal elements comprise a plurality of spaced apart elongated slats and said vertical elements comprise at least two spaced apart hoop-like straps to which said slats are secured, said slats extending substantially around a periphery of said straps and wherein said body is flexible so that the force of waves transverse to the axis of said body can deform said body and so that objects striking said body can deform said body; and,

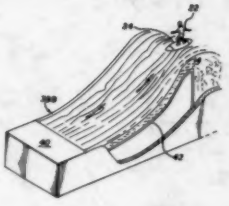
a ballast means for weighing down said barrier means.

4,954,014

SURFING-WAVE GENERATORS

Charles E. Sauerbier, Arroyo Grande, Calif., and Thomas J. Lochtefeld, 1620 Cresdo Dr., La Jolla, Calif. 92037, assignors to Thomas J. Lochtefeld, La Jolla, Calif.

Continuation-in-part of Ser. No. 54,521, May 27, 1987, Pat. No. 4,792,250. This application Dec. 19, 1988, Ser. No. 286,964
Int. Cl.[5] A63B *69/00*
U.S. Cl. 405—79 **26 Claims**



1. A wave-forming means for forming a tunnel wave on the surface of a body of water, comprising:

a. means of propelling a body of water in a first direction;

b. generator hull means being partially submerged in said body of water, said body of water moving thereagainst in said first direction, and said generator hull means having an area of shaped face thereon having width and length thereof, said shaped face:

1. having concave curvature in sections both parallel and normal to said surface;

2. facing generally in a second direction opposite to said first direction and having:

A. an inclination with respect to said surface and said second direction; and

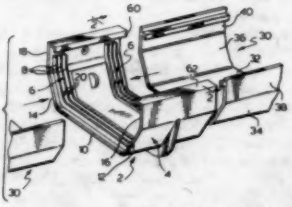
B. an attitude with respect to said second direction.

4,954,015

GUTTER SEAL

Vince J. McGowan, Thornton, Canada, assignor to GSW Inc., Barrie, Canada

Filed Apr. 4, 1990, Ser. No. 503,936
Int. Cl.[5] E02B *5/00*
U.S. Cl. 405—121 **15 Claims**



1. An eavestrough fitting comprising a moulded plastic member having secured thereto a gasket, said gasket having at least two ribs extending across said member and up the sides thereof, said ribs being sized to form a seal with an appropriately shaped eavestrough inserted within said fitting, said moulded plastic member having a generally flat base connected to outwardly angled sidewalls which terminate in a short vertical section, said gasket conforming to the shape of said moulded plastic member and including resilient aligning members associated with said ribs either side of said base on said outwardly angled sidewalls, said resilient aligning members urging the sidewalls of an inserted eavestrough towards

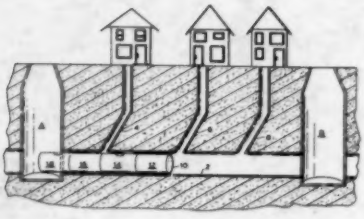
the center of said fitting causing the base of the inserted eavestrough to remain in sealing contact with the portion of said ribs secured to said base.

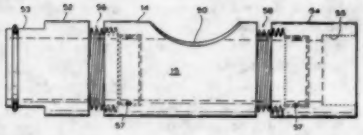
4,954,016

SEWER PIPE RELINING METHOD

Christer Storgard, Vasa, Finland, assignor to Oy Wiik & Hoglund AG, Vasa, Finland

Filed Mar. 9, 1989, Ser. No. 320,999
Claims priority, application Canada, Apr. 13, 1988, 564,076-8
Int. Cl.[5] F16L *55/18, 9/22;* **E03F** *3/06*
U.S. Cl. 405—184 **4 Claims**





1. In a method for the repair of sewer mains having lateral openings with reliner pipe by the steps of:

measuring a section of sewer main to determine the length thereof and location of lateral openings;

preparing short lengths of reliner pipe adapted to fit together and conform with the measurements of the sewer mains;

providing certain sections of reliner pipes with lateral openings corresponding to the lateral openings in the sewer main;

inserting the aforesaid lengths in sequence and advancing the connected sections through the sewer main until the reliner pipe extends through the entire section of the sewer main;

the improvement which comprises adapting the lengths of reliner pipe which have lateral openings to fit together with adjacent lengths of reliner pipe by means which will allow circumferential and longitudinal adjustment of the reliner lateral openings relative to the sewer main lateral openings by rotation of said lateral opening reliner pipe lengths after the reliner pipe has been installed throughout the entire section of the sewer main.

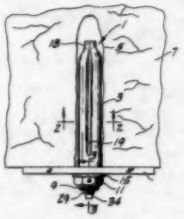
4,954,017

EXPANSION BOLT AND MINE ROOF REINFORCEMENT

Robert L. Davis, and Harold D. Keith, both of Rolla, Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 205,601, Nov. 10, 1980, Pat. No. 4,636,115. This application Sep. 10, 1986, Ser. No. 906,269
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[5] E21D *21/00*
U.S. Cl. 405—259 **32 Claims**

1. An expansion bolt adapted for insertion in an initial unexpanded condition in a circular hole drilled in a body in which the bolt is to be anchored, and adapted to be expanded girthwise after being inserted in the hole to anchor it in the hole, said bolt having an elongate hollow shank portion constituted by a relatively thin-walled tubular metal member closed at one end constituting its inner end as inserted in the hole and having a head at its other end constituting its outer end, said head being exteriorly threaded for reception of a nut and extending out of the hole when the bolt is anchored in the hole, said tubular member being adapted to receive a fluid under pressure, said tubular member being of closed cross section and of generally circular overall outline smaller than the circular hole



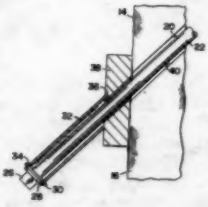
for insertion of the bolt therein and being of fluted formation with a portion within said outline such as to enable girthwise expansion thereof under pressure of fluid therein for pressure engagement of a major portion thereof having a generally cylindrical outer surface with the body within the hole, and said head being constructed for delivery of fluid under pressure into said tubular member whereby, following insertion of the tubular member in a hole, fluid under pressure may be delivered into the tubular member to cause it to expand girthwise into pressure engagement of said generally cylindrical outer surface with the body within the hole for anchoring it in the hole.

4,954,018

YIELD TUBE BOLT ASSEMBLY

Michael Gauna, Tuscaloosa, Ala., assignor to Jim Walter Resources, Inc., Birmingham, Ala.

Continuation of Ser. No. 741,995, Jun. 6, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 6,304
Int. Cl.[5] E21D *21/00*
U.S. Cl. 405—259 **4 Claims**



1. In a mine in which an elongated rib bolt is fixed at one end in a receiving hole in a mine wall and said rib bolt has an exposed portion extending outwardly beyond the face of said mine wall and terminating in an exposed end, said rib bolt having a predetermined failure strength, the combination comprising a bearing plate mounted on said rib bolt portion and resting against said mine wall, a collapsible cylindrical metal tube encompassing said rib bolt mounted on said exposed portion between said bearing plate and said exposed end, and means mounted on said exposed end for tightly compressing said cylindrical metal tube and said bearing plate together and

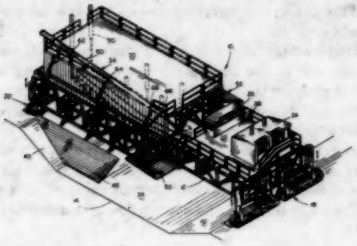
forcing said bearing plate tightly against said face of said mine with a predetermined torque, said cylindrical metal tube being capable of withstanding said predetermined torque but being gradually, longitudinally collapsible in response to an applied force greater than said predetermined torque but lower than said predetermined failure strength of said rib bolt, whereby said mine wall expands outwardly while said cylindrical metal tube keeps constant tension on said rib bolt.

4,954,019

METHOD AND APPARATUS FOR LINING A CANAL

D. William Giroux, 694 Umpqua Pl., LaConner, Wash. 98257

Filed Aug. 18, 1989, Ser. No. 395,811
Int. Cl.[5] E02B *5/02*
U.S. Cl. 405—268 **23 Claims**



5. A machine for lining a water filled irrigation canal having a generally horizontally disposed bottom and side walls extending upwardly and outwardly therefrom, comprising,

an elongated frame means having a length sufficient to span the canal,

means on the opposite ends of said frame means for propelling said frame means along the length of the canal,

means on said frame means for laying an elongated sheet of flexible, impervious material on a portion of the canal as said frame means is propelled along the canal

means on said frame means for applying a layer of concrete over a majority of said sheet material as said frame means is propelled along the canal,

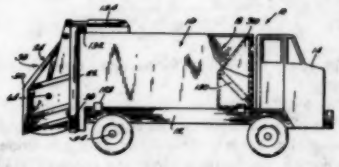
and means for substantially shielding the sheet material from water current as the sheet material is applied.

4,954,020

APPARATUS FOR LOADING MATERIALS INTO A STORAGE COMPARTMENT

Fred T. Smith, and Fred P. Smith, both of Palos Verdes Peninsula, Calif., assignors to The Heil Co., Milwaukee, Wis.

Filed Mar. 13, 1989, Ser. No. 322,346
Int. Cl.[5] B30B *1/08*
U.S. Cl. 406—38 **37 Claims**



1. An apparatus for loading materials into a storage compartment having a floor and a ceiling comprising

wall means defining a hopper for receiving the materials to be loaded, said wall means further defining an inlet for receiving the materials into said hopper and an outlet that, in use, communicates with the storage compartment generally at the level of the floor thereof;

first panel means operative for movement within said hopper between an opened position permitting material to enter said hopper inlet and a closed position closing said hopper inlet; and

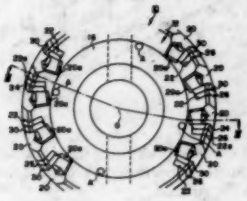
packing means on said first panel means for expelling materials from said hopper through said outlet during movement of said first panel means from said opened position toward said closed position, said packing means including packer wall means movable through the hopper outlet in a path that pushes the materials upwardly above the level of the floor of the compartment and in the direction of the ceiling of the compartment.

4,954,021

INSERTED ROTARY CUTTER

Osamu Tsujimura, Kawasaki; Tatsuo Arai, Kitamoto, and Takayoshi Saito, Shinagawa, all of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,937
Claims priority, application Japan, Jun. 10, 1988, 63-143033; Jun. 10, 1988, 63-076983[U]
Int. Cl.[5] B23C *5/22*
U.S. Cl. 407—35 **12 Claims**



1. An inserted rotary cutter comprising:

a tool body having an axis of rotation therethrough and having a plurality of insert mounting seats formed on a forward end portion thereof;

at least one first insert having at least one end cutting edge facing forwardly of the body for the purpose of removing material from a workpiece and at least one wiper insert for removing a thin layer of material in a smoothing operation, said wiper insert having at least one end cutting edge which is longer than that of said first insert, each of said inserts being releasably mounted to a respective insert mounting seat and being arranged so that the end cutting edge of said wiper insert projects further from said tool body than the end cutting edge of said first insert by a predetermined distance; and

indicating means provided on said tool body for distinguishing visually said insert mounting seat for said wiper insert from said insert mounting seat for said first insert;

said insert mounting seat for said wiper insert being distinguishable and being formed so as to have a dimensional precision within 0.01 mm in an axial direction, while said insert mounting seat for said first insert is formed as to have a dimensional precision above 0.01 mm in an axial direction.

4,954,022

METHOD FOR MACHINING MULTIPLE CUTS IN A WORKPIECE TO A UNIFORM DEPTH

James L. Underwood, Kennesaw; Floyd K. Williams, Marietta, and Ricky W. Tumlin, Ackworth, all of Ga., assignors to Underwood Mold Co., Inc., Woodstock, Ga.

Filed Jun. 16, 1989, Ser. No. 367,030
Int. Cl.[5] B23B *35/00*
U.S. Cl. 408—1 R **18 Claims**

1. A method for machining a surface of a workpiece with a

tool to provide multiple cuts having uniform depths comprising the steps of:

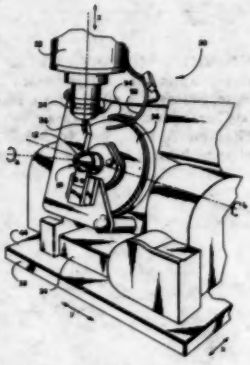
a. orienting the workpiece with respect to a reference coordinate;

b. recording an expected position of the surface of the workpiece with respect to the reference coordinate;

c. advancing the tool toward the surface;

d. sensing contact of the tool with the surface;

e. advancing the tool a predetermined distance to thereby machine the workpiece to a predetermined depth;



f. recording a sensed position of the workpiece with respect to the reference coordinate as a result of the contact of the tool with the surface;

g. comparing the sensed position to the expected position and calculating a deviation of the surface from the reference coordinate; and

h. using the deviation to monitor the position of the workpiece to assure that the position of the surface of the workpiece is accurately sensed during subsequent machining steps.

4,954,023

INTERNAL CUTTING HEAD FOR DRIFTING PIPE

Scott Bromley, Lovington, N. Mex., assignor to Scott Tech International, Inc., Lovington, N. Mex.

Filed Sep. 27, 1989, Ser. No. 413,540

Int. Cl.[5] B23B *47/00*

U.S. Cl. 408—1 R **23 Claims**

19. A method for drifting large casing that can be used for casing a borehole comprising the steps of:

supporting a track means in aligned relationship with a shaft; releasably securing a joint of casing in aligned relationship with said shaft, rotating one end of said shaft by a motor mounted on a cart; and moving said cart along said track while one end of said shaft is supported to said cart on said track means;

connecting a cutterhead to the other end of said shaft wherein said cutterhead is arranged for removing irregularities from the inside of a joint of casing, including a plurality of cutter devices on said cutterhead;

cutting the inner wall of a joint of casing to thereby provide the joint of casing with a minimum inside diameter; providing said cutterhead with a mandrel adapted to be connected to said rotatable shaft and adapted to be moved axially along the interior of the casing by movement of said cart along said track;

mounting a first and a second alignment device, spaced from one another, on said mandrel; connecting said cutter device to be rotated by said mandrel; mounting the cutter device between the alignment devices; and arranging said cutter device and said first and second alignment device along a common axial center line;

forming cylinders within each said alignment device and arranging said cylinders in radially aligned relationship respective to the mandrel and circumferentially arranging said cylinders within said alignment device; reciprocatingly mounting a radially active piston within each cylinder; extending said pistons into contact with the inner wall of the casing and thereby engaging the interior wall of the casing;

flowing cutting oil through said shaft, mandrel, cutter device, and to the cutting elements; and forming a return flow path for the cutting oil to return from the cutterhead, through the casing interior, and to a location where the oil can be accumulated and reused;

moving said cart along said track whereby joints of casing are sequentially positioned in alignment with said cutterhead and the inner surface thereof engaged with the cutterhead to provide a casing section of a minimum diameter.

4,954,024

PRECISION BORING TOOL

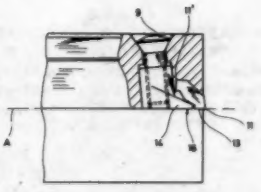
Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to Mapal Fabrik Fur Prazisionswerkzeuge Dr. Kress KG, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,089

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1987, 3741332; Dec. 17, 1987, 3742740

Int. Cl.[5] B23B *51/00*

U.S. Cl. 408—153 **21 Claims**



1. A precision boring tool for an inner machining of bores comprising

a boring tool body having a longitudinal roation axis;

a cutting plate having a cutting edge;

a bracing claw holding the cutting plate in position against the boring tool body, wherein the cutting plate is tilted relative to a plane running through the cutting edge of the cutting plate and through the longitudinal rotation axis of the boring tool body, and thus the cutting plate is disposed in a groove furnished in the boring tool body of the precision boring tool, wherein the cutting plate contacts a surface, generated by the cutting edge moving with the rotating boring tool body, only with the active cutting edge.

4,954,025

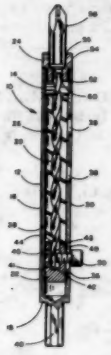
ANCHOR SET TOOL

Danny E. Crawford, and Doug Rogge, both of Charles City, Iowa, assignors to Diversified Fastening Systems, Inc., Charles City, Iowa

Filed Jan. 16, 1990, Ser. No. 466,058

Int. Cl.[5] B25F *3/00*

U.S. Cl. 408—238 **4 Claims**



1. An improved tool adapted for use with a hand drill for installing screw anchors in concrete or masonry walls or the like . comprising:

(a) a sleeve type body having:

(1) an axial bore with a closed rear end and an open front end;

(2) a longitudinally aligned open slot in said body;

(3) at least one depth notch associated with the front portion of said slot.

(b) a handle extending outwardly from the rear end of said body and receivable in the chuck of said drill;

(c) a bit holder slidably located in said bore and having an axial cavity and a bit retention means that extends from one side of said holder through the slot in said body and secures said bit in said cavity such that the sidewalls of said bit holder cavity closely encircle said bit handle;

(d) a drill bit with a handle secured in said bit holder cavity;

(e) a coil spring through which said bit extends and having a rear end that abuts against said bit holder, said spring serving as a bias means to urge said bit in a rearward direction;

(f) a driver means located at the front end of said body and having:

(1) a head portion with a stair stepped socket; and

(2) a neck portion positioned in the bore of said body and having a passageway that extends from the bottom of said head socket through said neck portion and opens to said body bore for closely encircling said bit to serve as a bit guide means; and

(g) means for securing said driver means to said body.

4,954,026

SCREWDRIVER BIT AND CHUCK KEY RETAINER

Donald W. Zurwelle, Lutherville, Md., assignor to Black & Decker, Inc., Newark, Del.

Filed Feb. 2, 1990, Ser. No. 474,193

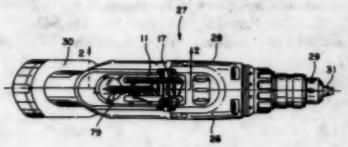
Int. Cl.[5] B23B *45/00*

U.S. Cl. 408—241 R **14 Claims**

1. A retainer for alternatively storing a screwdriver bit or a chuck key having two portions, said retainer comprising:

a base;

first and second parallel spaced cavities in the base for receiving either a screwdriver bit or one chuck key portion; and



a third cavity perpendicular to and intersecting the first and second cavities, said third cavity for receiving the other chuck key portion.

4,954,027

PROCESS FOR THE DISCONTINUOUS PROFILE GRINDING OR PROFILE MILLING OF GEAR WHEELS

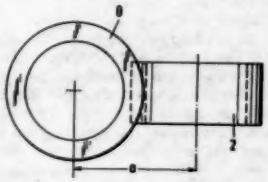
Ingo Faulstich, Ludwigsburg, Fed. Rep. of Germany, assignor to Hermann Pfauter GmbH & Co., Ludwigsburg, Fed. Rep. of Germany

Filed May 12, 1989, Ser. No. 350,897

Claims priority, application Fed. Rep. of Germany, May 12, 1988, 3816270

Int. Cl.[5] B23F *5/20*; B24B *1/00*

U.S. Cl. 409—26 **3 Claims**



1. A process for the discontinuous profile grinding or milling of gear wheels with wheel-type or shank-type tools in which the flanks of a workpiece are worked with one tool or with a tool for the right and left flanks in separate operations, comprising the steps of:

(a) setting approximate parameters a, e, ζ and ψ for the workpiece to be worked by the tool so as to avoid large profile deviations, wherein

a is the center-to-center or profile distance between predetermined points on the tool and workpiece,

e is the eccentricity of the tool,

ζ is the swiveling angle of the tool, and

ψ is the initial angle of rotation of the tool;

(b) determining by calculation or trial the profile of the workpiece resulting from work on the workpiece by the tool based on said approximate parameters;

(c) providing a predetermined required profile for the finished workpiece;

(d) comparing said work results and profile with the required profile of the finished workpiece;

(e) altering said setting parameters;

(f) determining the work profile of the workpiece based on the altered setting parameters, and

(g) repeating the process in the aforesaid manner until the work profile corresponds with the required profile for the finished workpiece.

4,954,028

PROCESS FOR MAKING, FINISHING CROWN WHEELS

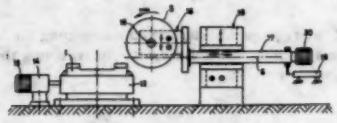
Jan M. Seroo, Bochelt, Belgium; Martinus H. Cuypers, Eindhoven, and Anthonius J. H. M. Oude Maatman, Oldenzaal, both of Netherlands, assignors to Hankamp B.V., Netherlands

Filed Feb. 23, 1989, Ser. No. 314,543

Claims priority, application Netherlands, Feb. 24, 1988, 8800472

Int. Cl.[5] B23F *23/10, 5/08*

U.S. Cl. 409—26 12 Claims



1. A method of using a disc-type element to make and/or finish a crown wheel, said crown wheel being intended for mating and meshing with a predetermined cylindrical gear, said disc-type element being rotatable about a first axis of rotation, said disc-type element having a peripheral working section, the cross-sectional profile of said working section of said disc-type element corresponding substantially to the tooth profile of the cylindrical gear, the diameter of said disc-type element being considerably larger than the diameter of the cylindrical gear, the method comprising the steps of:

positioning said disc-type element relative to said crown wheel such that said working section of said disc-type element is disposed in a position to work a longitudinal tooth space of said crown wheel;

working said tooth space by rotating said disc-type element about said first axis;

tilting said disc-type element about a second axis of rotation, said second axis being perpendicular to said first axis and parallel to said longitudinal tooth space, said second axis coinciding with the axis of rotation of the cylindrical gear;

rotating said crown wheel during the step of tilting said disc-type element such that the ratio of the angular velocity of said tilting of said disc-type element to the angular velocity of said rotating of said crown wheel equals the transmission ratio between the cylindrical gear and said crown wheel.

4,954,029

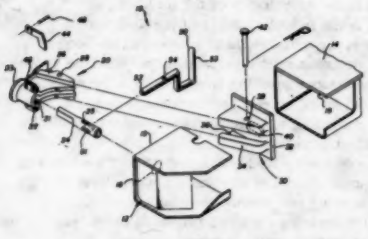
REMOVABLE CHASSIS FRONT PIN AND FRONT BOLSTER END ASSEMBLY

Robert O. Durkin, 1735 Twentieth St., NW., Washington, D.C. 20009

Filed Aug. 2, 1985, Ser. No. 761,836

Int. Cl.[5] B60P *7/00*

U.S. Cl. 410—80 11 Claims



1. A device for front end locking of containers on a chassis comprising a lock pin, a guideway assembly, said guideway assembly comprising a keyway member and a key member slideably mounted to said keyway member, said lock pin being moveable between a locking position in which one end of said lock pin protrudes from one end of said guideway assembly and a release position in which said one end of said lock pin is retracted into said guideway assembly, an operating handle pivotally mounted to said guideway assembly for pivotal movement within said guideway assembly, said lock pin including a chamber into which a portion of said handle extends allowing said handle when pivoted to cam said lock pin and reciprocally drive the lock pin within said guideway assembly.

4,954,030

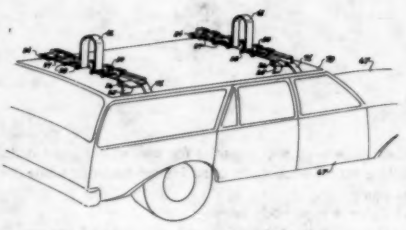
LOAD HAULER

Robert M. Szucs, 2585 Dodge Rd., East Amherst, N.Y. 14051, and Roy L. Bright, 5038 Tonawanda Creek Rd., North Tonawanda, N.Y. 14120

Filed Apr. 26, 1989, Ser. No. 343,285

Int. Cl.[5] B65D *63/00*

U.S. Cl. 410—96 4 Claims



1. A load hauler device comprising a stabilizer bar, isolator pins, binder means, a tension means, and support securing means, said stabilizer bar being an elongated member having fixed to one end thereof a binder securing means and at an opposite end thereof said tension means, said binder means secured to said binder securing means and extending at a length beyond said opposite end of said stabilizer bar, a plurality of said isolator pins extending outwardly from a side of said stabilizer bar, and wherein said isolator pins have tightening means and have a portion which encircles the side periphery of said stabilizer bar, and an extending portion connected to the portion which encircles, and said extending portion extending beyond the side periphery of said stabilizer bar, said binder means extendable through and beyond a portion of said stabilizer bar containing said pins, said binder capable of entering said tension means and being tightened thereby, said support securing means positioned near terminal end portions of said stabilizer bar and having means to connect said stabilizer bar to a supporting surface on a transporting vehicle.

4,954,031

TIE RAIL CONSTRUCTIONS

Joseph S. Geeck, III, 701 Roseland Pkwy., Harahan, La. 70123

Continuation-in-part of Ser. No. 240,849, Sep. 6, 1988. This application May 15, 1989, Ser. No. 351,381

Int. Cl.[5] B61D *45/00*

U.S. Cl. 410—110 20 Claims

1. A tie down device for attachment to the top of an upstanding linear wall, which device comprises:

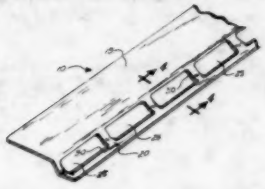
(1) a linear top section adapted to be fastened longitudinally onto the top of said linear wall; and

(2) a linear side section depending from said top section such that when said top section is fastened longitudinally onto the top of said wall, the side section extends downwardly and outwardly at an obtuse angle alpha from the top section, said side section being further characterized in that:

(a) said side section flares outwardly at an obtuse angle beta along its median portion to thereby form

(i) a linear upper portion immediately adjacent said top section and

(ii) a linear lower portion spaced from said top section by said linear upper portion, said linear upper portion



and said lower portion being in a non-planar relationship; and

(b) said side section contains a plurality of linearly disposed apertures adapted to receive at least one flexible tying member, said apertures being linearly disposed at least in part in said linear lower portion.

4,954,032

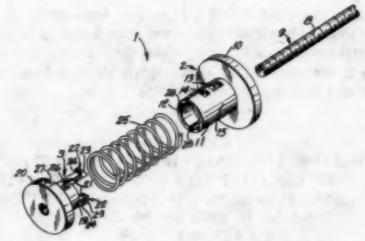
ANTI-BACKLASH NUT

Victor H. Morales, Westbury, N.Y., assignor to Windfred M. Berg, Inc., Brooklyn, N.Y.

Filed Nov. 13, 1989, Ser. No. 435,190

Int. Cl.[5] F16B *38/22*; F16H *1/14*

U.S. Cl. 411—289 **35 Claims**



1. An anti-backlash nut comprising at least two nut segments, each nut segment having an internal threaded bore adapted to receive a threaded member therein, one nut segment having at least a portion thereof insertable within the other nut segment, means for interlocking the nut segments together, said interlocking means comprising resilient lock means on one nut segment and means on the other nut segment for removably receiving the resilient lock means and resilient means acting on said nut segments to exert pressure on the nut segments to permit them to move linearly relative to each other.

4,954,033

TRANSFER MECHANISM FOR CONVEYOR

Raymond H. Sanders, Alta Loma, Calif., assignor to Unico, Inc., Ontario, Calif.

Filed Jun. 11, 1984, Ser. No. 619,531

Int. Cl.[5] B65G *57/04*; B65H *29/00*

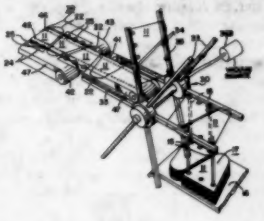
U.S. Cl. 414—27 **10 Claims**

1. A conveyor system for conveying a succession of this flexible sheets from a sheet forming mechanism to a sheet stacking mechanism, comprising in combination:

(a) a first conveyor belt for carrying a succession of thin flexible sheets from a sheet forming mechanism, said first conveyor belt having a plurality of vent holes therein, said sheets being positioned to extend beyond at least one side of said belt;

(b) a source for providing a vacuum force through said vent holes to hold said sheets onto said belt;

(c) auxiliary conveyor belt means operatively positioned alongside said first belt at least in the region of said sheet forming mechanism, to support the portion of said sheets extending beyond the side of said first belt, said first belt and said auxiliary conveyor belt means being flat and



substantially level and underlying substantially the entire surface of each sheet;

(d) wherein aid first belt extends beyond the end of said auxiliary conveyor belt means a sufficient distance to support at least one entire sheet, with a portion of the sheet overhanging one side of said first belt; and

(e) transfer means having extensions movable upwardly adjacent at least one side of said first belt to lift the overhanging portion of each sheet off of said first belt and deposit the sheet onto a sheet stacking mechanism.

4,954,034

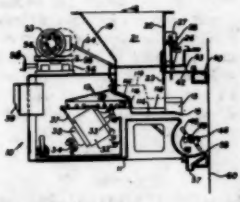
VIBRATORY FUEL FEEDER FOR FURNACES

Joseph L. Durante; Eric A. Nelson, and Fere C. Nieminski, all of Erie, Pa., assignor to Zurn Industries, Inc., Erie, Pa.

Continuation-in-part of Ser. No. 657,876, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 374,525, May 3, 1982, abandoned. This application Mar. 24, 1986, Ser. No. 843,296

Int. Cl.[5] B65G *49/00*

U.S. Cl. 414—156 **9 Claims**



1. In combination a stoker for feeding solid fuel to a furnace and a furnace comprising,

a vibratory feeder having a frame,

a furnace,

means connecting said vibratory feeder frame to said furnace,

a vibratory feeder supported on said frame,

said vibratory feeder comprising a tray having a bottom and electrical means to vibrate said tray,

resilient means supporting said tray on said frame,

said tray having a first end and a discharge end adapted to be positioned adjacent said furnace and a loading area adjacent the first end thereof,

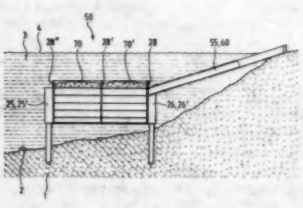
a solenoid operated movable free means to vibrate said tray and move said fuel relative to said tray to move fuel on said tray from said first end toward said discharge end,
said vibrating means being supported on resilient means from said frame,
said tray having an extension means oppositely directed from the tray discharge,
said tray having a bottom surface engaging resilient means and non-resilient means extending from said vibrating means,
a hopper means supported above said first end of said tray in vertical spaced relation thereto,
and fuel moving means supported below said discharge end for receiving fuel from said discharge end of said tray and moving said fuel into said furnace,
said fuel moving means comprises a rotary distributor supported below said discharge end of said tray,
said rotary distributor comprising a shaft extending laterally of said feeder,
said shaft having a plurality of blades thereon,
said distributor blades being supported in a housing.

4,954,035

VEHICLE PARK FOR PARKING VEHICLES BELOW A WATER SURFACE

Hannes Strebel, Luppmen, Hittnau, Switzerland

Filed Oct. 24, 1988, Ser. No. 261,506
Claims priority, application Switzerland, Oct. 26, 1987, 4175/87
Int. Cl.[5] E04H *6/00*
U.S. Cl. 414—228 **12 Claims**



1. Vehicle garage for parking vehicles below water surface of a lake, a river, or the like, comprising a large container constructed as a ship-hull and which can be stationed below the water surface, said container including at least one parking level, and at least one tubular tunnel arranged on said parking level and connected to a lake or river bank for a transit of vehicles and persons; and raising and lowering means for raising and lowering the garage with respect to said water surface to level the garage depending upon topographical conditions and loading-dependent changes thereof.

4,954,036

VARIABLE HEIGHT SILO CHARGE SYSTEM

Harold A. Walker, 326 Hickory Bluff, Johnson City, Tenn. 37601

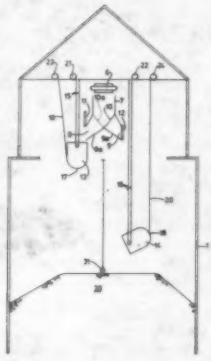
Filed Jul. 15, 1988, Ser. No. 220,030
Int. Cl.[5] B65G *65/38*
U.S. Cl. 414—295 **18 Claims**

1. In a silo for receiving, holding and discharging particulate matter, including delivery means for delivering said matter to the top of said silo, said delivery means being fixed in location with respect to said silo, comprising:

(a) a plurality of containers disposed within said silo, said containers being movable between a respective first position which is fixed in location at and with respect to the top of said silo, and a respective second position, the location of said second positions being immediately above and varying with the level of said matter previously deposited into said silo, said containers configured to receive said matter at said first position, to transport said matter from said first position to said second position, and to discharge said matter at said second position;

(b) means for transporting each of said containers between said first position and said second position;

(c) means located at the top of said silo for receiving said matter from said delivery means and for depositing said



matter into said containers when said containers are located at said first position, said receiving means being fixed in location with respect to said silo and to said delivery means; and

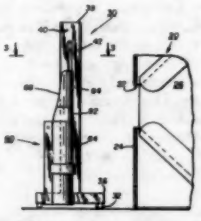
(d) means for discharging said matter from each of said containers when said container is at said second position, whereby when said matter is discharged from said container, said matter falls a sufficiently short distance such that said matter remains substantially intact.

4,954,037

METHOD FOR ALIGNING, LIFTING AND TILTING A CONTAINER RELATIVE TO A VERTICAL APERTURE

Helmut Habicht, 15 Royal Park Ter., Hillsdale, N.J. 07642

Filed Jul. 10, 1989, Ser. No. 377,063
Int. Cl.[5] B65G *65/23*
U.S. Cl. 414—389 **14 Claims**



1. A method of discharging articles from a container into a defined substantially vertical aperture by lifting and selectively tilting the container carried on a discharge lifting platform of a power assisted lifting apparatus which includes the following steps:

(a) placing a major axis of the discharge lifting platform in a substantially vertical array by positioning a bottom shelf of the discharge lifting platform in a substantially downward and horizontal condition, and a tapered discharge chute in an upwardly extending vertical condition;

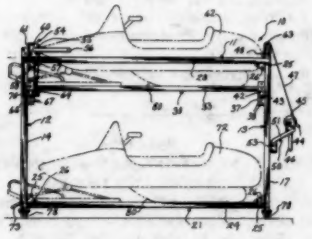
(b) aligning the vertical major axis of the discharge lifting platform in a selected spaced relationship with the center of the vertical aperture;
(c) retaining the container of articles on the bottom shelf of the discharge lifting platform in substantially vertical array;
(d) simultaneously inserting the tapered discharge chute into and through the vertical aperture while lifting and rapidly tilting the discharge lifting platform during a first segment of the lifting movement;
(e) maintaining the insertion of the tapered discharge chute in and through the vertical aperture by tilting the discharge lifting platform at a slower uniform angular rate during at least one subsequent lifting segment as and when the discharging platform is brought to a fully lifted height;
(f) guiding the articles discharging from the container into and through the vertical aperture by carrying the articles on and over the tapered discharge chute;
(g) returning the empty container to a more or less starting position by lowering and tilting the discharge lifting platform and bringing its major axis to substantially vertical array.

4,954,038

TWO-TIER STORAGE RACK FOR VEHICLES

Thomas H. Sheahan, 2389 W. Rawson Ave., Oak Creek, Wis. 53154

Filed Jul. 18, 1989, Ser. No. 381,308
Int. Cl.[5] B60P *3/08*
U.S. Cl. 414—482 **16 Claims**



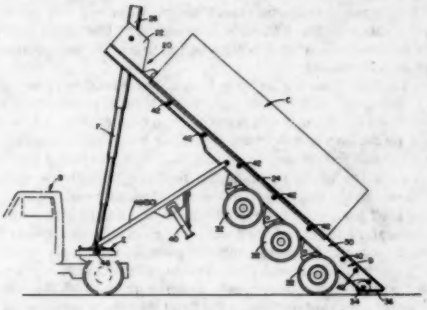
1. A two-tier storage rack for vehicles comprising:
a generally rectangular open framework, including a lower horizontal frame member and a pair of spaced vertical rear legs and a pair of spaced vertical forward legs, each of said legs being attached to and extending upwardly from said horizontal lower frame member each of said legs having an upper portion;
an upper vehicle support platform overlying said horizontal frame member and having a pivotal connection at one end to the upper portion of the rear legs, such that said platform may be pivoted between an inclined loading position with its other end adjacent one end of the lower frame member and an upper storage position with said other end raised to the upper portion of said forward legs;
said pivotal connection including a series of vertically spaced pivot holes on the upper portion of each rear leg, the pivot holes in each rear leg disposed in horizontal alignment with the pivot holes in the other rear leg, and a pivot bar demountably insertable through said one end of the upper vehicle support platform and a pair of aligned pivot holes in said rear legs to selectively establish the vertical position of said pivotal connection; and,
positioning means operatively attached to said framework for pulling a first vehicle onto said upper support platform in the loading position, for raising said other end of said upper support platform and a first vehicle thereon to the storage position, and for pulling a second vehicle onto said lower horizontal frame member beneath said support platform.

4,954,039

UNIFRAME ROLLOFF DUMPSTER

William T. Johnston, Randolph; Leslie Smith, Jr., Beloit, and David K. Barker, Alliance, all of Ohio, assignors to Trailstar Mfg. Corp., Alliance, Ohio

Filed Oct. 27, 1988, Ser. No. 263,532
Int. Cl.[5] B60P *1/08*
U.S. Cl. 414—500 **1 Claim**



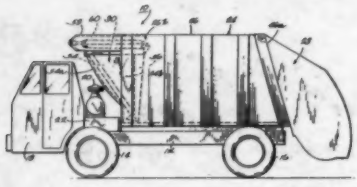
1. A trailer adapted for attachment to an associated tractor for transporting containers, the trailer comprising:
an elongated, rigid frame having opposed first and second ends;
a jack stand assembly disposed adjacent the frame first end for maintaining the frame generally horizontal when the trailer is disconnected from the associated tractor;
wheels disposed adjacent the frame second end for transporting the trailer;
a support plate adapted for selective engagement with a fifth wheel of an associated tractor, the support plate being substantially smaller than the frame, and securing the frame to the tractor without an intermediary frame element;
first and second draft arms each pivotally secured at opposite ends to the support plate and frame, respectively;
means for selectively raising the frame first end and pivoting the frame about the wheels, the raising manes adapted to facilitate loading and unloading of an associated container on and off the frame, a first end of the raising means being secured to the support plate and a second end of the raising means being secured to the frame first end;
a double acting power cylinder and cable arrangement received on the frame for moving the associated container relative to the frame at least twice the distance of the stroke of the power cylinder, one end of the cable being secured to the frame, extending around a first pulley disposed at one end of the power cylinder, around a second pulley disposed at the opposite end of the power cylinder, around a third pulley disposed at the one end of the power cylinder, around a fourth pulley at the other end of the power cylinder, and adapted for connection with the associated container; and
means for locking the frame against longitudinal and lateral movement relative to the support plate.

4,954,040

REFUSE TRUCK BODY HAVING LOAD CARRYING EJECTOR ASSEMBLY

Fred T. Smith, and Fred P. Smith, both of Palos Verdes Peninsula, Calif., assignors to The Heil Co., Milwaukee, Wis.

Filed Mar. 14, 1989, Ser. No. 322,999
Int. Cl.[5] B65F *3/00*; B62D *23/00*
U.S. Cl. 414—513 **4 Claims**



1. In a refuse collection truck having front and rear wheels, and a cab positioned entirely forward of at least a portion of the front wheels, a truck body adapted to receive and compress refuse, comprising:

a container having an open forward end and an open rearward end, said forward end being located rearward of the front wheels and said rearward end being open for loading refuse into and discharging refuse from said container;

a tailgate for releasably closing said open rearward end;

an ejector assembly mounted for longitudinal movement within the container between a retracted position over at least a portion of the front wheels and an ejection position nearer the rear of the truck, said ejector assembly having triangular side panels and an upwardly forwardly inclined ejection panel, such that a portion of said ejection panel is positioned simultaneously underneath part of the refuse and over said portion of the front wheels, thus allowing at least a portion of the refuse to rest forward of said forward end of said container and partially over the front wheels; and

a linear actuator mounted horizontally above said ejector assembly and the front wheels, for moving said ejector assembly longitudinally within said container.

4,954,041

TRIPLE SECTION TELESCOPIC BOOM MATERIALS HANDLING VEHICLE

E. Arthur Dahlquist, Burnville; Allan D. Jenkins, Maple Plain; David C. Truehart, Lakeville, and Richard B. Baxter, Two Harbors, all of Minn., assignors to Lull Corp., St. Paul, Minn.

Continuation of Ser. No. 111,823, Oct. 21, 1987, abandoned. This application May 24, 1989, Ser. No. 356,804
Int. Cl.[5] B66F *9/06*
U.S. Cl. 414—718 **31 Claims**

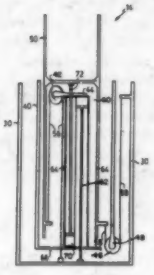
1. A variable reach rough terrain load lifting apparatus comprising:

a vehicle having a frame;

a boom comprising innermost, intermediate and outermost telescoping boom segments, said intermediate boom segment having first and second hydraulic cylinders mounted therein, said first hydraulic cylinder connecting said outermost and intermediate boom segments for extending and retracting said intermediate boom segment, and said second hydraulic cylinder connecting said intermediate and innermost boom segments for extending and retracting said innermost boom segment, said innermost boom including end effector means attached to the forward end thereof;

fluid conduit means extending through said boom segments at least a portion of which includes flexible hose extending from a first position fixed on said innermost boom segment to a second portion fixed on said outermost boom segment for directing hydraulic fluid through said boom to said end effector means, said intermediate boom segment further comprising a pair of pulleys positioned on opposite sides of said hydraulic cylinders in a rearward portion of said intermediate boom segment, said pulleys contacting said flexible hose and traveling between first and second positions for preventing entanglement of said flexible hose when said innermost and intermediate boom segments are extended or retracted;

means for pivotal connection of the boom to the vehicle frame and capable of reciprocal longitudinal movement



therewith, while preventing buildup of corrosion products which would interfere with the pivotal movement of said boom with respect to said vehicle and further facilitating repair or replacement thereof due to normal operation;

means for elevating and lowering said boom;

means for reciprocating longitudinal movement of said boom and pivotal connection means with respect to said vehicle frame; and

means for stabilizing said vehicle when said boom is extended.

4,954,042

DOUBLE TELESCOPING ARM FOR ROBOTIC PALLETIZERS AND THE LIKE

Kenneth F. Becicka, Alvin, and Neal C. Chamberlain, Hoopeston, both of Ill., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 12, 1988, Ser. No. 242,669
Int. Cl.[5] B66C *23/00*
U.S. Cl. 414—718 **4 Claims**

1. A telescoping horizontal arm adapted for use in a robotic palletizer, comprising:

an elongate outer member having an associated longitudinal axis;

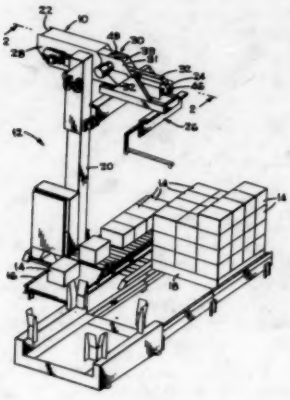
an elongate intermediate member having a longitudinal axis aligned substantially parallel with said outer member longitudinal axis and telescopically received in said outer member, said intermediate member including an elongate lower surface;

an idler wheel mounted within said intermediate member for rotating in a substantially vertical plane, said idler wheel extending partly below said lower surface into contact with said outer member;

an elongate inner member telescopically disposed within said intermediate member and having a longitudinal axis aligned, substantially parallel with said intermediate member longitudinal axis and said inner member engaging said idler wheel; and

means for displacing said inner member relative to said intermediate member in a direction substantially parallel to said inner member longitudinal axis, said displacing means rotating said idler wheel and said idler wheel displacing said intermediate member and said inner member relative to said outer member, said means for displacing comprises a motorized wheel fixedly mounted on said intermediate member and engaging said inner member so

as to extend said inner member relative to said intermediate member in response to rotation of said motorized



wheel in one direction and to retract said inner member relative to said intermediate member in response to rotation of said motorized wheel in the opposite direction.

4,954,043

BALANCE MECHANISM OF AN INDUSTRIAL ROBOT

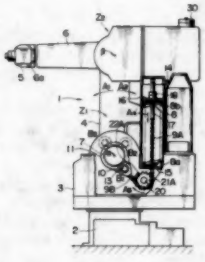
Mitsutoshi Yoshida; Toshio Tsubota, and Hiroshi Okumura, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo K.K., Tokyo, Japan

Continuation of Ser. No. 7/234,269, Aug. 19, 1988, abandoned. This application Feb. 7, 1990, Ser. No. 477,114

Claims priority, application Japan, Nov. 17, 1987, 62-288347

Int. Cl.[5] B66C *23/72*

U.S. Cl. 414—719 **2 Claims**



1. A balance apparatus for an industrial robot having a first arm swingably disposed at a center of rotation on a stand and a second arm swingably disposed at a distal end of the first arm about a center of rotation, said apparatus comprising:

I. a first balance mechanism including:

a. a coupling body disposed in the center of rotation of a proximal end of the first arm and adapted to move angularly in synchronism with said first arm;

b. a pin support removably fixed to said coupling body at a number of changeable positions, a pin projecting from said support at a position spaced from the center of rotation of said coupling body;

c. a coupling element rotatably disposed at said pin of said pin support;

d. a spring having one end fixed to the stand;

e. a flexible coupling device having one end fixed to said coupling element and another end fixed to the other end of said spring; and

f. a guide for guiding said flexible coupling device to move said spring in a direction in which said spring is deformed when said first arm is moved angularly such that said flexible coupling device can move a distance corresponding to the rotation of said first arm; and

II. the second arm having one operative wrist at one side of the center of rotation of the second arm, a second balance mechanism, including:

a. a weight adjusting counter balancer opposite to the operative wrist with respect to the center of rotation of said second arm to balance the weight of said operative wrist about the center of its rotation relative to said first arm,

III. the position of said removably fixed pin support on said coupling body being changeable to any one of a number of positions to vary the compression of said spring to correspond to the load of the first and second arms due to the posture of the installation of the robot.

4,954,044

METHOD AND MECHANISM FOR ORIENTATING CUP BODIES FOR A SYSTEM FOR AUTOMATICALLY CONNECTING HANDLES TO THE CUP BODIES

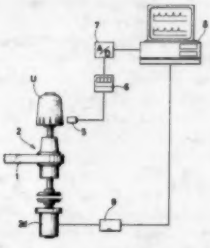
Isao Chizaki, Toki, Japan, assignor to Shin-Ei Kiko Co., Ltd., Nagoya, Japan

Filed Aug. 28, 1989, Ser. No. 399,309

Claims priority, application Japan, Nov. 30, 1988, 63-303483

Int. Cl.[5] B25J *1/00*

U.S. Cl. 414—754 **5 Claims**



1. A mechanism for automatically orientating cup bodies for a system for automatically connecting handles to the cup bodies, which includes support means for supporting cup bodies and a transparent means for conveying the cup bodies from a cup-body loading position to a cup discharge position, said mechanism comprising

(a) a cup-body rotating means,

(b) means for measuring a peripheral configuration of a side wall of a cup body conveyed from the cup-body loading position by the transport means, while the cup body is rotated about a central vertical axis thereof by the cup-body rotating means,

(c) a central control means for comparing the peripheral configuration of the side wall of the cup body and a peripheral configuration of a side wall of a sample cup body as determined in advance, for determining whether the two peripheral configuration coincide with each other, and for determining an angle by which the cup body is to be rotated to orientate it in a selected direction for the connection of a handle to the cup body at a predetermined position thereon if the two peripheral configurations do not coincide with each other, and

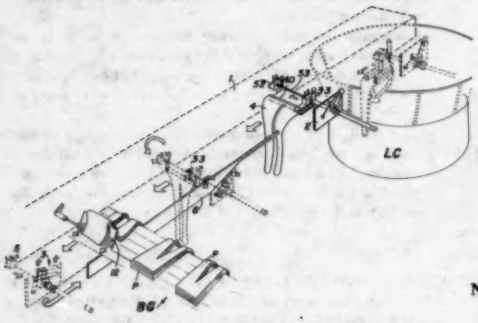
(d) means for rotating the cup-body rotating means by said angle to orientate the cup body in the selected direction.

4,954,045

APPARATUS AND METHOD FOR TRANSFERRING ARTICLES FROM A SEWING MACHINE

Vinicio Gazzarrini, Florence, Italy, assignor to Solis S.r.l., Florence, Italy

Filed Oct. 17, 1988, Ser. No. 259,039
Claims priority, application Italy, Oct. 16, 1987, 9511-A/87
Int. Cl.[5] D05B *21/00*
U.S. Cl. 414—792.7 **13 Claims**



1. An apparatus for automatically transferring pantyhose articles having a body portion including an opening with an elastic band and two leg portions and which have spaced-apart seams in said body portion with and unloading station for packing the pantyhose, comprising a sewing machine unloading station, a packing station spaced from said unloading station, a bearing structure including a straight horizontal track extending from said unloading station to said packing station, a carriage movable backwardly and forwardly on said track and provided with a gripper engageable with the elastic band of the pantyhose when the pantyhose is still fitted over a shape portion of the sewing machine so that the opening of the pantyhose around the elastic band is turned inwardly of the sewing machine, a stylus on said carriage relatively moveable apart with respect to said gripper, said gripper lying in a vertical plane, to orient the pantyhose elastic band while the elastic band is held by said gripper with the seams of the pantyhose substantially on the vertical plane, rotation means including a cam fixed on said bearing structure for rotating said elastic band of thus oriented pantyhose about a horizontal axis, a lever with a roller sliding on said cam, a sector gear affixed to said lever and engaged with a gear on said cam shaft, a return spring affixed to said gripper, a shelf underlying said gripper engageable against the pantyhose for allowing the pantyhose to be oriented so as to lay the elastic band on one side of said underlying shelf over said unloading station with the leg portions of said pantyhose on the other side of said shelf.

4,954,046

PERISTALTIC PUMP WITH MECHANISM FOR MAINTAINING LINEAR FLOW

Ronald D. Irvin, Ramona, Calif.; David Burkett, Baldwin, Ga.; David E. Kaplan, Moraga, and Ronald J. Harvey, Escondido, both of Calif., assignors to IMED Corporation, San Diego, Calif.

Filed Dec. 8, 1989, Ser. No. 447,880
Int. Cl.[5] F04B *43/12*
U.S. Cl. 417—53 **17 Claims**

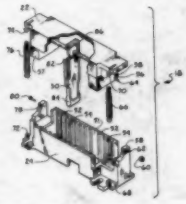
1. A linear peristaltic pump having a mechanism for maintaining linear flow of fluid through an I.V. tube comprising:

a casing;

a rotatable camshaft having an upstream end and a downstream end operatively mounted on said casing;

a plurality of fingers coupled to said camshaft;

a housing for establishing linear reciprocal movement of said fingers in response to rotation of said camshaft for establishing a moving zone of occlusion along said tube from an upstream end to a down stream end of said tube; and



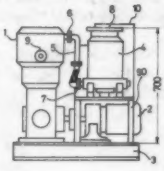
aligning means connecting said casing to said housing and adjustable to tilt said camshaft to prevent unwanted pressure build up in said tube and maintain substantially linear flow of fluid therethrough.

4,954,047

EVACUATION APPARATUS

Nobuhisa Okuyama; Shiuichi Goto, both of Chiba, and Tsugio Enomoto, Kyoto, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan and Mikuni Jukogyo Co., Ltd., Osaka, Japan

Filed Oct. 5, 1989, Ser. No. 417,569
Claims priority, application Japan, Oct. 8, 1988, 63-252895
Int. Cl.[5] F04B *23/10*
U.S. Cl. 417—203 **6 Claims**



1. An evacuation apparatus, comprising: a reciprocating, cylinder-and-piston, vacuum pump and a turbomolecular pump connected in series with said reciprocating vacuum pump;

said reciprocating vacuum pump comprising a casing, said casing having therein at least one pump set composed of a non-lubricated cylinder having a reciprocating piston therein, said piston and said cylinder of each set having two suction-delivery chambers defined between the opposite end faces of said piston and the opposing internal end walls of said cylinder, said suction-delivery chambers being connected in series, a suction nozzle and a delivery nozzle for each suction-delivery chamber, a suction valve for each suction nozzle, a delivery valve for each delivery nozzle, the suction nozzle of the first suction-delivery chamber of the series being open for connection to the delivery opening of the turbomolecular pump, the delivery nozzle of the last suction-delivery chamber of the series being adapted to be connected to the ambient atmosphere or other receiver, each other delivery nozzle being connected to the suction nozzle of the next following suction-delivery chamber, an elongated, reciprocable piston rod connected to the piston of each pump set and extending therefrom through the end wall of the associated cylinder, said piston rod having a longitudinally extending portion located outside said casing, the longitudinally extending portion of said piston rod having a radially enlarged section opposed to the end wall of said casing, a metallic bellows fixed at one end thereof to said radially enlarged section of said piston rod and fixed at the

other end thereof in sealing relationship to said casing, said bellows surrounding said piston rod for sealing the space outside said bellows from the space inside the casing;

said turbomolecular pump comprising a substantially cylindrical housing having a suction opening at one axial end thereof, said suction opening having a diameter of the same order of magnitude as the diameter of said housing, said housing being closed at the other axial end thereof and having a delivery opening in the vicinity of the other axial end of said housing, a coaxial rotatable shaft in said housing, a coaxial drive motor mounted in said housing close to said delivery opening and connected to the adjacent end of said shaft, a rotor coaxial with said motor and connected to said shaft at the end thereof adjacent to said suction opening, a plurality of movable blades mounted on said rotor for rotation therewith, said movable blades extending radially outwardly with respect to said the rotor, said movable blades being arranged to define a plurality of axially spaced-apart stages and each movable blade being inclined in a common direction relative to a plane perpendicular to the axis of rotation of said rotor, said housing having a plurality of stationary blades mounted thereon and extending radially inwardly therefrom, said stationary blades being arranged to define a plurality of axially spaced-apart stages with the stages of said movable and stationary blades being interdigitated with each other, each stationary blade being inclined in a common direction and reversely to the direction of said movable blades relative to a plane perpendicular to the axis of rotation of said rotor, blade angles of said movable blades being arranged so that a gas is driven from the suction opening to the delivery opening when said rotor is rotated, the suction opening of said turbomolecular pump being connectible to the apparatus to be evacuated.

4,954,048

PROCESS AND DEVICE FOR CONVEYING BOILABLE LIQUIDS

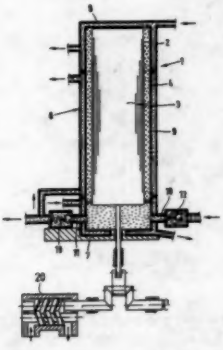
Dirk Ohrt, Stolberg, Fed. Rep. of Germany, assignor to Rendamax BV, Netherlands

Filed Dec. 30, 1988, Ser. No. 292,335

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1987, 3744487

Int. Cl.[5] F04B *19/24*

U.S. Cl. 417—209 **10 Claims**



1. A process for conveying boilable liquids wherein the required delivery pressure is generated by alternately changing the boiling pressure of a boilable liquid from a low starting point to a boiling pressure, increased by the desired increase in pressure by an external heat input and then the original state is reproduced by reducing the pressure to the low boiling pressure by dissipating the heat externally, wherein in the vessel through which the boilable liquid to be conveyed flows, a subquantity of the boilable liquid to be conveyed is subjected directly to the work performing cyclic process in the wet steam region.

4,954,049

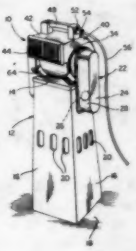
AIR CIRCULATION DEVICE

Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Continuation of Ser. No. 73,085, Jul. 14, 1987, abandoned. This application Jun. 27, 1989, Ser. No. 372,175

Int. Cl.[5] F04B *39/12*

U.S. Cl. 417—234 **8 Claims**



1. An air circulation device comprising a hollow housing having a squirrel cage blower rotatably mounted therein and driven by an internally mounted motor with the housing including oppositely disposed air inlets for the squirrel cage blower, an air discharge outlet incorporated into said housing for discharge of air, said discharge outlet including adjustable louvers to provide directional control for air being discharged from the blower, and a vertically disposed supporting stand for the blower housing, said stand being hollow and including air inlet openings adjacent the lower end thereof but spaced upwardly from the lower end thereof, filter means in said stand above the air inlet openings for filtering air passing inwardly through the inlet openings and upwardly in the stand, air passage means extending from the upper end of the stand to the inlets in the blower housing, said air passage means including externally mounted tubular members connected to the air inlets through doughnut shaped, compressible, resilient foam seals thereby providing air circulation of filtered air, said filter means including a pair of upwardly inclined filter members inserted through slot-like openings in the stand above the air inlet openings, said blower housing including a handle and mounting plates engaged with the upper end of the stand for detachable connection thereto for enabling the blower and housing to be separated from the stand and used independently thereof.

4,954,050

WOBBLE PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Teruo Higuchi; Kiyoshi Terauchi, both of Isesaki; Kazuhiko Takai, Maebashi; Sei Kikuchi, and Hideto Kobayashi, both of Isesaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Division of Ser. No. 157,782, Feb. 19, 1988, Pat. No. 4,875,834. This application May 15, 1989, Ser. No. 352,056

Claims priority, application Japan, Feb. 19, 1987, 62-36443; Feb. 19, 1987, 62-36444

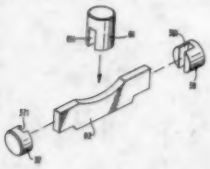
Int. Cl.[5] F04B *27/08*

U.S. Cl. 417—269 **1 Claim**

1. In a wobble plate type compressor with a variable displacement mechanism, said compressor comprising a compressor housing having a cylinder block provided with a plurality of cylinders and a crank chamber adjacent said cylinder block,

a front end plate attached to said housing at one end adjacent said crank chamber, a piston slidably fitted within each of said cylinders, a drive shaft rotatably supported in said housing, a rotor fixed on said drive shaft and further connected to a variably inclined plate, a wobble plate adjacent said inclined plate with each of said plurality of pistons coupled at one end with said wobble plate, rotational motion of said inclined plate being converted into nutational motion of said wobble plate, and a rotation preventing mechanism to prevent rotation of said wobble plate, the improvement comprising:

said rotation preventing mechanism comprising a pair of



circular discs, each said circular disc including an elongated slit at one end surface thereof, one said disc rotatably disposed in a hole formed on an inner surface of said front end plate and the other of said discs rotatably disposed in a hole formed on the surface of said cylinder block, a guide plate extending within said crank chamber, each end surface of said guide plate disposed in one of said elongated slits of said circular discs, said circular discs and said guide plate rotatable together, and a cylindrical block disposed in a hole formed in an extended portion of said wobble plate, said cylindrical block including a vertical groove therein slidably fitted on said guide plate.

4,954,051

AIR SPRING SEAT AND AIR PUMP

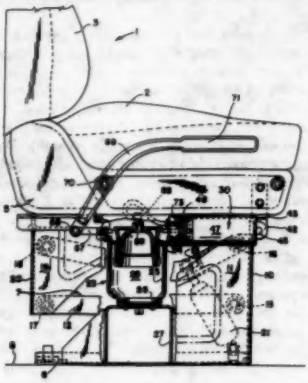
Rod Smith, Seymour, Tenn.; Timothy L. Oliphant, Federal Way, and Charles E. Stephens, Kent, both of Wash., assignors to National Seating Company, Vonore, Tenn.

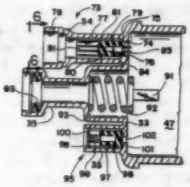
Division of Ser. No. 103,934, Oct. 2, 1987, Pat. No. 4,809,944. This application Jan. 12, 1989, Ser. No. 282,515

Int. Cl.[5] F04B *49/00*

U.S. Cl. 417—305 **9 Claims**

1. A fluid pump comprising a body means having a first end, a second end and a generally cylindrical portion extending therebetween cooperatively to define a fluid chamber; a piston reciprocally movable in the fluid chamber and guided by the cylindrical portion of the body means, the piston having a compression stroke toward the first end and a return stroke toward the second end; a floating seal carried by the piston slidingly to engage the cylindrical portion during the compression stroke to seal the piston to the cylindrical portion and to provide a clearance between the seal and the cylinder during the return stroke; fluid inlet means in the second end to admit fluid to the fluid chamber during the compression stroke of the piston; fluid outlet means in the first end, said outlet means being operative to deliver pressurized fluid from the fluid chamber during the compression stroke of the piston; and pressure equalizing means adjacent the first end of the cylindrical portion operative at the end of the compression stroke to exhaust any pressurized fluid remaining between the piston and





first end to stabilize the piston relative to the cylindrical portion in an at rest position.

4,954,052

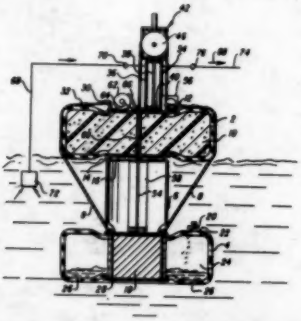
WAVE POWERED PUMP

Walter J. Simmons, Martinsburg, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1989, Ser. No. 324,546

Int. Cl.[5] F04B *17/00*

U.S. Cl. 417—331 **14 Claims**



1. A land and water transportable apparatus positionable in a body of water for extracting energy from wave action in said body of water, comprising:

(a) a wheel-shaped float means positionable on the surface of said body of water operable by wave action;

(b) a wheel-shaped anchor means for positioning on the bottom of said body of water for anchoring said float means;

(c) a spacer being disposed between said float means and said anchor means for securing said float means to said anchor

means when said apparatus is transported to a deployment site;

(d) said spacer having release means for separating said float means from said anchor means upon positioning of said apparatus at the deployment site;

(e) means for securing said float means to said anchor means when said float means is separated from said anchor means; and

(f) means associated with said float means for converting wave action energy to useful work.

4,954,053
FREE-PISTON COMPRESSOR WITH GAS SPRING CONTROL

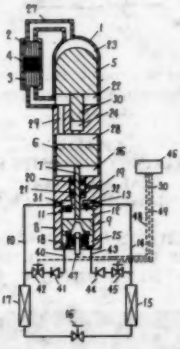
Kenichi Inoda, Hirakata, and Terumaru Harada, Ikoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1988, Ser. No. 284,122

Claims priority, application Japan, Dec. 14, 1987, 62-315915; Aug. 30, 1988, 63-215432

Int. Cl.[5] F04B *49/08*

U.S. Cl. 417—379 **8 Claims**



1. A free-piston type compressor comprising:

a cylinder;

a compressor piston means, disposed movably in said cylinder, for dividing said cylinder into a spring chamber and a compression chamber and for compressing fluid contained in said compression chamber;

low-pressure fluid flow means, connected to said compression chamber, for introducing low-pressure fluid into said compression chamber;

high-pressure fluid flow means, connected to said compression chamber, for receiving high-pressure fluid from said compression chamber after its has been compressed by said compressor piston means;

a first pipe fluidically connected between said low-pressure fluid flow means and said spring chamber;

a first control valve disposed in said first pipe;

a first check valve means, disposed in said first pipe, for preventing flow through said first pipe from said low-pressure fluid flow means to said spring chamber;

a second pipe fluidically connected between said high-pressure fluid flow means and said spring chamber;

a second control valve disposed in said second pipe;

a second check valve means, disposed in said second pipe, for preventing flow through said second pipe from said spring chamber to said high-pressure fluid flow means;

detecting means for detecting the dead space between said compressor piston and an end of said cylinder; and

control means for controlling said control valves and to adjust one of the top-dead position and the bottom-dead position of said compressor piston to be at a predetermined location in said cylinder.

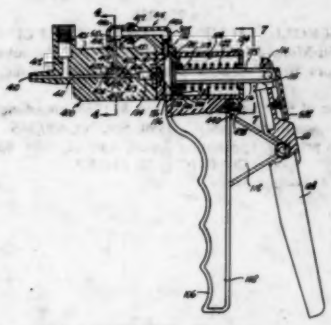
4,954,054
HAND-HELD VACUUM AND PRESSURE PUMP

Theodore C. Neward, 9251 Archbald Ave., Cucamonga, Calif. 91730

Continuation-in-part of Ser. No. 904,697, Sep. 8, 1986, Pat. No. 4,775,302. This application Sep. 30, 1988, Ser. No. 252,195

Int. Cl.[5] F04B *41/00, 39/10*

U.S. Cl. 417—440 **10 Claims**



5. An adapter for converting a hand-held vacuum pump to be convertible between either a vacuum pump or a pressure pump, said vacuum pump having:

(a) cylinder means and having an inlet opening and an outlet opening,

(b) biased piston means for creating a pressure differential and for drawing air through the inlet opening of the cylinder means when said biased piston means is drawn back,

(c) inlet valve means coupled with the inlet opening of the cylinder means, and outlet valve means coupled with the outlet opening of the cylinder means,

(d) said adapter comprising valving means for location between the inlet valve means and the outlet valve means, having a port to the valving means, the valving means being movable between a first position wherein the differential pressure creates a pressure at the port and the pump acts as a pressure pump, and a second position wherein a vacuum is created at the port and the pump acts as a vacuum pump.

4,954,055
VARIABLE ROLLER PUMP TUBING

Donald A. Raible, Santa Ana, and William K. Morrow, San Clemente, both of Calif., assignors to Baxter International, Inc., Deerfield, Ill.

Filed Jun. 22, 1989, Ser. No. 369,806

Int. Cl.[5] F04B *43/12*

U.S. Cl. 417—477 **4 Claims**

1. A roller pump assembly comprising:

a pump head assembly having a tube raceway along which one or more pump rollers travel; and

a variable diameter tubing having a substantially constant wall thickness situated which is formed with two end portions having substantially similar internal diameters and a central larger diameter section situated between said two end portions, said larger diameter central section gradually increasing in diameter from each of said end portions, with said gradual increase in diameter being at a rate of no greater than about thirty degrees per inch, and

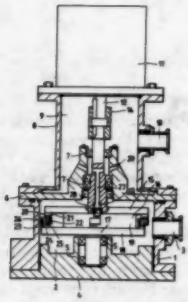
wherein said tubing central section is dimensioned to lie substantially along the entire length of said raceway.

4,954,056

SCROLL MACHINE WITH PIN COUPLING

Yoshifumi Muta, and Kozaburo Fujii, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 281,372, Dec. 8, 1988, abandoned. This application Feb. 13, 1990, Ser. No. 480,345
Claims priority, application Japan, Apr. 14, 1988, 63-93940
Int. Cl.[5] F01C *1/04;* F16D *3/16*
U.S. Cl. 418—55.3 3 Claims



1. A scroll machine, comprising: a first scroll (13) driven by a driving source (11), a second scroll (17) disposed eccentrically with respect to said first scroll and associated therewith to compress fluid, a plurality of first pins (22) arranged on said first scroll along a first circle coaxial with said scroll and protruding axially of said first scroll, an equal plurality of second pins (25) arranged on said second scroll along a second circle having the same radius as that of said first circle and protruding axially thereof, and an equal plurality of connecting members (26) for individually coupling associated and proximate pairs of said first pins and said second pins such that center positions of said first and said second scrolls are always separated from each other by an eccentricity of said second scroll with respect to said first scroll, wherein each of the first and second pins has a convex cylindrical configuration, and each connecting member comprises an annular ring having a concave inner surface.

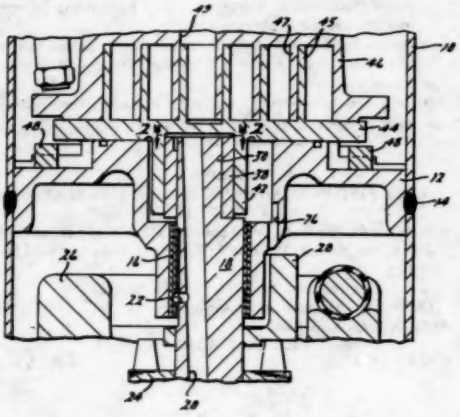
4,954,057

SCROLL COMPRESSOR WITH LUBRICATED FLAT DRIVING SURFACE

Jean-Luc Caillat, Dayton, and Stephen M. Seibel, Sidney, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Oct. 18, 1988, Ser. No. 259,252
Int. Cl.[5] F04C *18/04, 29/02;* F16C *32/06, 33/10*
U.S. Cl. 418—55.6 36 Claims

1. In a machine having two bearings, wherein one is a hydrodynamic bearing and the other is a hydrostatic bearing, the improvement comprising: first means for supplying lubricating oil from a source thereof to said hydrodynamic bearing; and an oil passage for supplying lubricating oil under pessure generated by said hydrodynamic bearing to said hydrostatic bearing to lubricate same, said passage communicating with said hydrodynamic bearing at a point where only relatively high pressures are developed by said hydrodynamic bearing.



4,954,058

METHOD FOR MAKING COMPOSITE SINTERED APEX SEAL MATERIAL

Gopal S. Revankar, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 211,732, Jun. 27, 1988. This application Jan. 25, 1990, Ser. No. 471,195
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—18 6 Claims

1. A method of making a wear resistant member comprising sintering a mixture of: (a) tungsten carbide particle and cobalt; and (b) a molybdenum, iron and cobalt alloy to form a sintered body containing more non-angular tungsten carbide particles than before sintering.

4,954,059

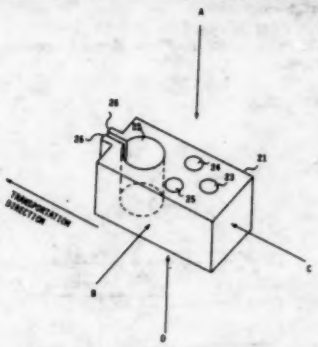
SEALANT BEAD PROFILE CONTROL

Jay Lee, Kings Park, and Alex Mauro, Wheatley Heights, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Division of Ser. No. 875,262, Jun. 17, 1986, Pat. No. 4,778,642. This application Jun. 10, 1988, Ser. No. 205,075
Int. Cl.[5] B29C *47/02;* B05C *11/06;* B05D *1/26*
U.S. Cl. 425—72.1 6 Claims

1. Apparatus for obtaining improved dispensed material profile control, comprising: a dispensing nozzle forming a viscous material under pressure into a stream of said material for forming a bead of said material on a surface; at least one first orifice located lateral to said nozzle and forming air under pressure into a first air stream directed toward said material stream; wherein the improvement comprises: at least one sec-

ond orifice located at a lateral distance greater than said first orifice from said nozzle and forming air under pressure into a second air stream directed toward said bead formed on said surface when said material stream is transported along said surface, said second air stream spreading out said bead of



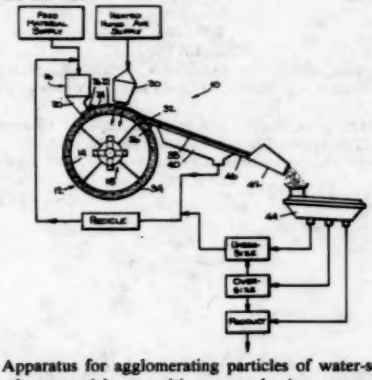
viscous material; said at least one first orifice and said at least one second orifice being positioned behind said dispensing nozzle and symmetrically about a line through and along said material stream of viscous material formed by said dispensing nozzle to selectively deform the cross-section of said bead into a predetermined shape.

4,954,060

APPARATUS FOR AGGLOMERATION

Sheng H. Hsu, Marysville, Ohio, assignor to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 180,226, Apr. 11, 1988, Pat. No. 4,840,809. This application Mar. 28, 1989, Ser. No. 329,530
Int. Cl.[5] A23F *5/12*
U.S. Cl. 425—85 **24 Claims**



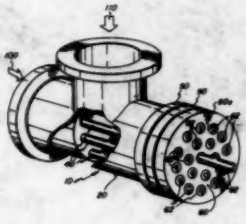
1. Apparatus for agglomerating particles of water-soluble particulate materials comprising means having a porous surface for conveying a layer of particulate material, means for directing a laminar flow of heated humid air towards the layer of material on the conveying means, and means for applying a reduced pressure from beneath the porous surface for drawing the heated humid air to the conveyed layer of material for contacting the heated humid air with the layer of particulate material for fusing particles of the material at points of contact between surfaces of the particles while substantially avoiding condensation of moisture in voids between the surfaces of the particles.

4,954,061

MULTI-ORIFICE COEXTRUSION APPARATUS

Kenneth M. Repholz, Crystal Lake, and Pradeep G. Kanade, Algonquin, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 90,699, Aug. 28, 1987, Pat. No. 4,900,572. This application Oct. 11, 1989, Ser. No. 419,680
Int. Cl.[5] B29C *47/06*; A21C *11/16*
U.S. Cl. 425—131.1 **20 Claims**



1. A multi-orifice coextrusion apparatus comprising:

(i) a first extruder positioned to feed a first extruded material into a manifold through a plurality of tubes;

(ii) a plurality of tubes extending from said first extruder through which said first extruder can feed the first extruded material into a manifold;

(iii) a second extruder positioned to feed a second extruded material into a manifold so as to flow around said plurality of tubes;

(iv) a manifold, which comprises a chamber into which said plurality of tubes extend and having a port for introduction of the second extruded material from said second extruder, wherein said chamber comprises a substantially open area to permit the second extruded material to flow around said plurality of tubes;

(v) a spacer plate mounted on said manifold which comprises a plurality of spacer passages each of which corresponds to each of said plurality of tubes, each of said spacer passages having an inner diameter greater than the outer diameter of each of said plurality of tubes, and each of said plurality of tubes being disposed in one of said plurality of spacer passages wherein an outer annular opening about an inner opening is formed by each spacer passage/tube combination, wherein said outer annular openings and said inner openings converge to form a plurality of extrusion orifices and said outer annular openings are configured to maintain substantially uniform distribution of the second extruded material about the first extruded material and substantially constant volumetric flow across the cross section of each of said extrusion orifices, said spacer passages each having a rotatable sleeve circumferentially variable in wall thickness.

4,954,062

APPARATUS FOR CASTING

Jere J. Willing, Grays Lake, Ill., assignor to Nu-Jer Electronics & Mfg. Inc., Grays Lake, Ill.

Filed Aug. 18, 1989, Ser. No. 395,902
Int. Cl.[5] B29C *39/04*
U.S. Cl. 425—135 **20 Claims**

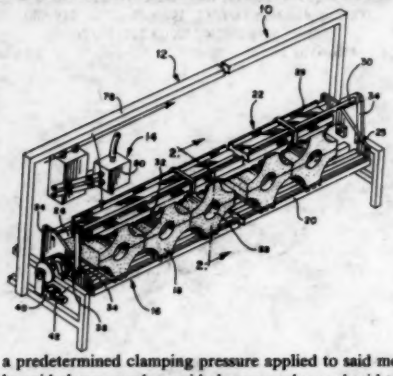
1. A mechanized apparatus for casting ceramic holloware, comprising:

a frame;

at least one rotatable table assembly mounted on said frame and dimensioned to releasably retain a plurality of molds therein, said table assembly including a table and a clamp member mounted between a pair of end plates, said end plates pivotally connected to said frame through first and second shafts associated therewith, said clamp member

being positionable between a closed position and an opened position relative to said table;

automated control means for positioning said clamp member between said opened position and said closed position, said control means including a load detector for detecting



a predetermined clamping pressure applied to said molds by said clamp member, said clamp member and said table retaining said plurality of molds therebetween; and

automated rotation means for rotating said table assembly when said clamp member is in said closed position.

4,954,063

INJECTION PRESSURE CONTROL APPARATUS FOR A DIE CAST MACHINE AND AN INJECTION MOLD MACHINE

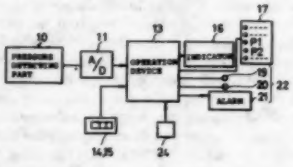
Norihiro Iwamoto, Zama, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,287

Claims priority, application Japan, Mar. 29, 1988, 63-41738[U]

Int. Cl.[5] B29C *45/82*

U.S. Cl. 425—149 **5 Claims**



1. An injection pressure control apparatus for a die cast machine comprising:

a pressure detecting part connected to an oil pressure circuit of an injection cylinder,

means for setting a first pressure value to be set based on a pressure value obtained when a pressure of said injection cylinder is increased and a second pressure value to be increased by a predetermined value more than the first pressure value,

an operation device including clock means which clocks a time duration from when a pressure value detected by the pressure detecting part exceeds the first pressure value to when said detected pressure value reaches to the second value, and means for comparing and processing whether said time duration clocked by the clock means is within a desired time or not,

an indicator means indicating the compared and processed result in the operation device.

4,954,064

APPARATUS FOR WINDING SHEETS OF DOUGH ON A DOUGH REEL AND DOUGH SHEETER EQUIPPED WITH A DOUGH SHEETER WINDER

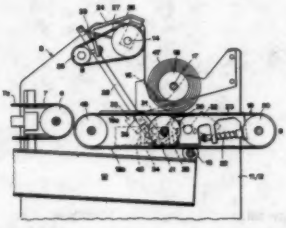
Peter Siegenthaler, Toffen, Switzerland, assignor to Seewer AG, Burgdorf, Switzerland

Filed Jul. 22, 1988, Ser. No. 223,290

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725090

Int. Cl.[5] A21C *3/06*

U.S. Cl. 425—162 **7 Claims**



5. In a dough winder for a dough sheeter having a dough reel, a conveyor belt for receiving a sheet of dough and conveying it to the dough reel, a drive roller, a support roller, and a guide roller movable between a resting position and a stand-by position, the conveyor belt running over the drive roller, the support roller, and the guide roller and resting at least in part against the dough reel when the guide roller is in the stand-by position, wherein the improvement comprises:

a motor and

a swivel support connected to said guide roller and pivotable by said motor from the stand-by position into the resting position.

4,954,065

MASTER DISK

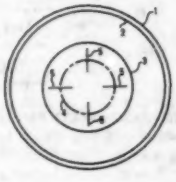
Koji Shindo, and Masaru Tsuchihashi, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 154,339, Feb. 10, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 406,848

Claims priority, application Japan, Mar. 24, 1987, 62-69478

Int. Cl.[5] B29C *33/42*

U.S. Cl. 425—175 **7 Claims**



1. A master disk, provided with guide tracks, forming a matrix of a stamper having a center hole whose center is the position corresponding to the center of said guide tracks, having an appointed number of calibration tracks formed at an appointed pitch symmetrically relative to a center of said guide tracks on both sides of a position corresponding to an edge portion of said center hole.

4,954,066

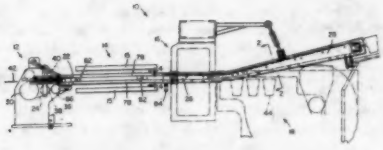
THERMOFORMING AND CONVEYOR CHAIN GUIDE APPARATUS

Lynn Leary, and Ronald C. Schumann, both of Batavia, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 20, 1988, Ser. No. 286,925

Int. Cl.[5] B29C *49/28*; B65G *15/10*

U.S. Cl. 425—388 **11 Claims**



1. A guided chain conveyor apparatus comprising:
(a) a roller conveyor chain having means for carrying a web of sheet material along a predetermined path;
(b) lower guide means positioned below the chain and extending in the direction of the predetermined path for supporting and guiding a run of chain;
(c) cover means positioned above the lower guide means and spaced therefrom to permit free passage of the chain between the lower guide means and the cover means, the cover means extending over the chain as a protective cover to prevent debris from falling onto the chain; and
(d) upper guide means for the run of chain positioned between the cover means and the chain and spaced from the lower guide means to define therewith a chain receiving passageway extending in the direction of the predetermined path, the upper guide means being a thin flexible member extending over the chain and sufficiently close thereto to provide an upper retaining surface to prevent tilting of the chain about an axis extending in the direction of the predetermined path.

4,954,067

HYDRAULIC PRESS

Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Japan

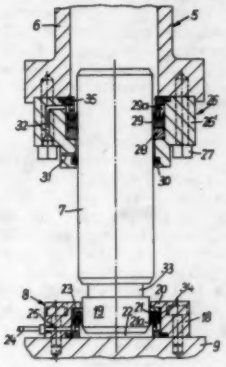
Filed Jan. 30, 1989, Ser. No. 303,348

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802761

Int. Cl.[5] B29C *43/32*; B30B *15/24*

U.S. Cl. 425—406 **14 Claims**

1. A hydraulic press comprising
(a) a press stand;
(b) a generally horizontal press plate vertically movably supported in the press stand and arranged for executing forward and return strokes;
(c) a plurality of hydraulic press cylinder units mounted in said press stand above the press plate; each press cylinder unit having
(1) a power cylinder having an end oriented towards said press plate; and
(2) a plunger slidably received in the power cylinder and extending from the power cylinder to said press plate; said plunger having a lower terminus;
(d) a plurality of hydrostatic bearings mounted on said press plate; a separate one of said hydrostatic bearings being associated with each plunger; each said hydrostatic bearing defining a chamber containing hydraulic fluid; said lower terminus of said plunger projecting into said chamber; the hydrostatic bearings constituting a force-transmitting arrangement between the plungers and said press plate and having means for permitting a tilting motion of the plungers relative to the press plate; and
(e) means mounted at said end of each said power cylinder for sealingly and tiltably guiding the plunger at said end of each said power cylinder, said tilting and guiding means including a guide ring surrounding said plunger, and said



guide ring having a sufficiently short axial length for permitting the tilting of the plunger at said end of said power cylinder.

4,954,068

HYDRAULIC PRESS

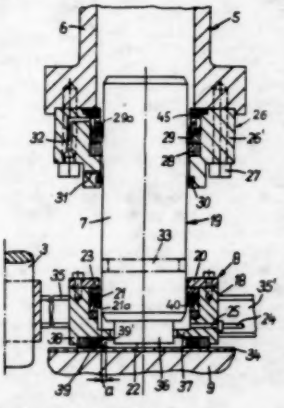
Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,350

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802761

Int. Cl.[5] B29C *43/32*; B30B *15/24*

U.S. Cl. 425—406 **12 Claims**



1. A hydraulic press comprising
(a) a press stand;
(b) a generally horizontal press plate vertically movably supported in the press stand and arranged for executing forward and return strokes;
(c) a hydraulic press cylinder unit mounted in said press stand above the press plate and having
(1) a power cylinder having an end oriented towards said press plate; and
(2) a piston rod longitudinally slidably received in the power cylinder and extending from the power cylinder

to said press plate; said piston rod having a lower terminus;

(d) a hydrostatic floating bearing assembly being loosely placed on a surface of said press plate for allowing displacement of the bearing assembly relative to the press plate; said hydrostatic floating bearing assembly defining a chamber containing hydraulic fluid; said lower terminus of said piston rod projecting into said chamber; the hydrostatic floating bearing assembly constituting a force transmitting arrangement between the piston rod and said press plate; said hydrostatic floating bearing assembly comprising

(1) an annular body surrounding said lower terminus of said piston rod and being coaxial therewith; said annular body being a sleeve-shaped component open at both axial ends; and

(2) a sealing ring positioned between said annular body and said surface of said press plate and being generally coaxial with said piston rod; said sealing ring sealingly engaging said annular body and said surface and having a working inner diameter which is smaller than the diameter of said lower terminus of said piston rod.

4,954,069

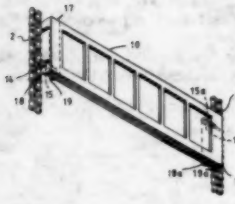
APPARATUS FOR MOLDING CHOCOLATE BARS

Franklin Friedwald, 3781 Mahlon Brower Dr., Oceanside, N.Y. 11572

Continuation-in-part of Ser. No. 138,960, Dec. 29, 1987, abandoned. This application Feb. 15, 1989, Ser. No. 311,475

Int. Cl.[5] B29C *39/06*; A23G *1/26*

U.S. Cl. 425—453 **2 Claims**



1. A machine for moulding chocolate bars, said machine comprising:

a pair of spaced apart conveyor chains, each chain having a plurality of spaced apart pins extending toward the other chain;

a plurality of unitary mould and carrier combinations each including at least one mould cavity depending from an upper horizontally extending wall of said mould and carrier combination and means for connecting each end of said combination directly to a respective adjacent chain, said means on each said end including a sheath slot extending from at least one downwardly extending wall, said wall extending downwardly from said upper wall of said mould and carrier combination and spaced from said cavity.

4,954,070

IN-MOLD LABEL DISPENSER HAVING SINGLE ACTUATOR FOR DISPENSING HEAD AND LABEL CARRIER

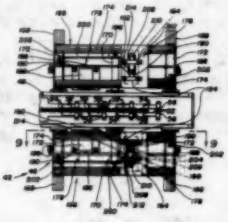
Richard L. Dunlap, Cairo, Ohio, assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Filed May 8, 1989, Ser. No. 330,095

Int. Cl.[5] B29C *49/24*

U.S. Cl. 425—503 **27 Claims**

1. An in-mold label dispenser for supplying labels to a plastic blow molding machine mold including a pair of mold sections that define cavity sections and are mounted for movement along a first direction toward and away from each other without any other movement between an open position spaced from each other and a closed position where the cavity sections define an enclosed cavity in which blow molding is performed, the label dispenser comprising: a base; a label supply; a dispensing head mounted by the base for rectilinear movement in a second direction perpendicular to the first direction between a withdrawn position with respect to the mold and an inserted position between the open mold sections; an actuator that moves the dispensing head between the withdrawn and inserted positions; a label carrier having an elongated shape including a first end pivotally mounted on the dispensing head and a second end for carrying labels from the label supply to the mold; the label carrier having a retracted position where the elongated shape thereof extends from the first end thereof toward the mold to the second end thereof along the second direction during movement of the dispensing head between the withdrawn and inserted positions; the label carrier having a label transfer position where the elongated shape thereof extends from the first end thereof toward the second end thereof along the first direction to transfer a label thereon to the mold; and a cam mechanism that pivotally moves the label carrier between the retracted and label transfer positions as the dispensing head moves under the impetus of the actuator to and from the inserted position while the second end of the label



carrier is moved along the first direction during the pivoting of the label carrier to ensure accurate positioning of the label within the mold.

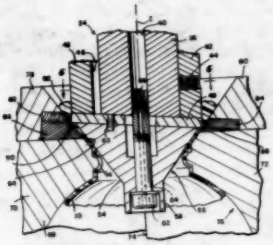
25. An in-mold label dispenser for supplying labels to a plastic blow molding machine mold including a pair of mold sections each of which defines a plurality of cavity sections and is mounted for movement along a first direction toward and away from the other mold section without any other movement between an open position spaced from the other mold section and a closed position where the cavity sections define a plurality of enclosed cavities in which blow molding is performed, the label dispenser comprising: a base; a dispensing head mounted by the base for rectilinear movement in a second direction transverse to the first direction between a withdrawn position with respect to the mold and an inserted position between the open mold sections; an actuator that moves the dispensing head between the withdrawn and inserted positions; a plurality of label carriers respectively mounted on the dispensing head; a label supply including a single label magazine; a magazine carrier that supports the label magazine for movement adjacent the dispensing head when the dispensing head is in the withdrawn position; a magazine actuator; and an eccentric rotatively driven by the magazine actuator and moving the magazine carrier in a cycloidal path while the dispensing head remains stationary in the withdrawn position in order to supply labels from the label magazine to said plurality of label carriers.

4,954,071

CALIBRATING BLOW PIN

George H. Austin, Marietta, Ga., assignor to Sewell Plastics, Inc., Atlanta, Ga.

Filed Sep. 28, 1989, Ser. No. 414,105
Int. Cl.[5] B29C *49/50, 49/58*
U.S. Cl. 425—531 20 Claims



1. A blow pin and blowing mold for use in blow-molding articles from an extruded parison comprising:

a mold having an article body defining portion and a finish defining portion including an anvil portion to permit severing of a flash portion of the parison from the article being molded, and

a blow pin, mounted for reciprocation with respect to the mold along an axis, having a first portion for introduction into the parison including a blow hole to inject blowing medium therein and a shearing ring portion for cooperation with the anvil portion to sever the flash portion of the parison from the article being molded,

the shearing ring portion and anvil portion both being inclined with respect to a plane normal to the axis of reciprocation of the blow pin to form an inclined finish on the article being molded.

8. A blow pin assembly for use in injecting blowing medium into an extruded parison comprising:

a center shaft including a blow hole along an axis thereof to permit the injection of blowing medium therethrough having a first end for receiving blowing medium and a second end, the surface of the center shaft surrounding the second end being inclined with respect to said axis;

a shearing ring mounted in contact with the center shaft inclined surface having an outer periphery extending radially beyond the periphery of the center shaft to form an inclined finish on an article to be created by the blowing medium;

a sleeve surrounding the center shaft including an inclined end surface contacting a surface of the shearing ring adjacent the periphery thereof, and coupling means for coupling the sleeve to the center shaft; and

a blow pin tip fixed to the shearing ring on a side opposite the center shaft and fastener means coupling the blow pin tip to the center shaft.

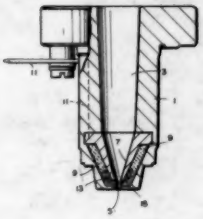
4,954,072

ELECTRICALLY HEATED PIN-POINT GATE

Wolfgang Zimmerman, Tulpenstrasse 15, D-8201 Schechen, Fed. Rep. of Germany

PCT No. PCT/EP87/00532, § 371 Date Mar. 10, 1989, § 102(e) Date Mar. 10, 1989, PCT Pub. No. WO88/01928, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 17, 1987, Ser. No. 332,279
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631850
Int. Cl.[5] B29C *45/20*
U.S. Cl. 425—549 13 Claims

11. An electrically heatable pinpoint gate nozzle for injecting plastic material into a cavity of a molding machine, said gate nozzle comprising means defining a nozzle body having a central flow channel for the plastic material, a low mass inside nozzle located inside said central flow channel and facing the



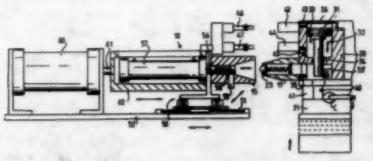
mold cavity, said inside nozzle including a Peltier element for heating said inside nozzle and means for supplying electrical energy to said Peltier element.

4,954,073

APPARATUS FOR HIGH FREQUENCY MOLDING OF LIQUID PLASTIC MATERIAL

Robert Oriez, Vendome, and Elie Gras, Genay, both of France, assignors to Anver, Maisons-Alfort Cedex, France

Filed May 4, 1989, Ser. No. 347,306
Claims priority, application France, May 4, 1988, 88 05968
Int. Cl.[5] B29C *45/22*
U.S. Cl. 425—547 3 Claims



1. High frequency molding apparatus for producing a molded object having a plastic part shaped as a closed loop around a substrate, said apparatus comprising:

a mold assembly (11) having a first opening and a second opening (40) and defining a mold cavity therewith;

feeding means (10) for filling the cavity of said mold by injecting a heat curable plastic into said first opening and for venting the cavity of said mold through said second opening, said feeding means comprising a female injection nozzle (15) and a female venting nozzle (16);

high frequency curing means (12) for subjecting said filled cavity to high frequency heating and pressure;

a male injection nozzle (17) and a male venting nozzle on said mold assembly respectively adjacent said second and first openings for communicating with said female injection nozzle and said female venting nozzle respectively;

control means (30) for controlling opening and closing of said male nozzles, said control means comprising first and second double action actuators comprising respective piston cylinder ram assemblies respectively associated with said male injection nozzle and said male venting nozzle, and comprising respective pistons and piston rods made of a material which does not exhibit dielectric loss,

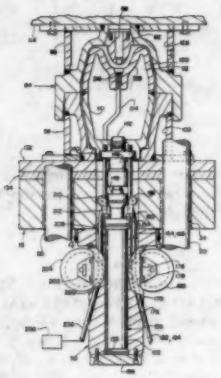
said actuators being mounted so that said piston rods slide respectively into and out from said first and second openings for respectively closing and opening the communication between said nozzles and said first and second openings, said male nozzles and said actuators forming a unit assembly removably associated with each mold fitted therewith.

4,954,074

INJECTION BLADDER PRESS

Zachariha Cohen, Cleveland Heights, Ohio, assignor to US Molding Machinery Company, Mentor, Ohio

Filed Aug. 4, 1988, Ser. No. 228,544
Int. Cl.[5] B29C *45/40*
U.S. Cl. 425—556 18 Claims



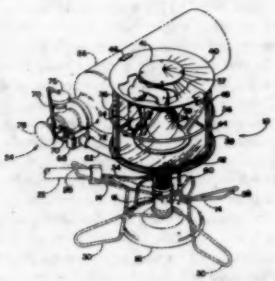
1. An injection molding press comprising a bottom bolster, a top bolster to which an upper part of a mold is attached, means connecting said top bolster to said bottom bolster, a moving bolster to which a lower part of the mold is attached, said moving bolster being located between said bottom and top bolster, first actuator means supported by said bottom bolster beneath said moving bolster for urging said moving bolster upwardly to squeeze the mold parts between said top bolster and said moving bolster, second actuator means operative independently of said first actuator means to lower and raise said moving bolster to open and close the mold, a mold core support to which a mold core is attached, said mold core support being movable relative to said moving bolster, and third actuator means carried by said moving bolster for raising and lowering said mold core support relative to said moving bolster.

4,954,075

LANTERN HEAD FOR BACKPACKER'S STOVE

Neal A. Francino, 1641 E. Del Rio, Tempe, Ariz. 85282

Filed Sep. 5, 1989, Ser. No. 402,682
Int. Cl.[5] F21H *1/00*
U.S. Cl. 431—107 8 Claims



1. A lantern head for converting an inverted backpacking stove to a lantern, wherein said stove has outward-extending legs supporting a central body and wherein said stove draws from a remote fuel vessel, said lantern head comprising, in combination:

a. a frame;

b. a globe supported by said frame;

c. fuel-burning means for producing light mounted within said globe;

d. means for delivering fuel to said light producing means;

e. mounting means for supporting said frame above the underside of said inverted stove's central body; and,

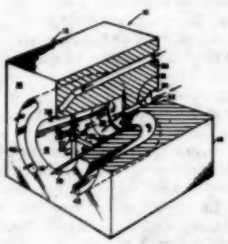
f. a fuel conduit having first and second ends wherein said conduit's first end is bound to said fuel delivery means, and wherein said second end has means for engaging a fuel vessel pump assembly, said assembly having an opening for a nozzle, a ridge for aligning an alignment block, and a groove for retaining a catch arm.

4,954,076

FLAME STABILIZED OXY-FUEL RECIRCULATING BURNER

Kenneth J. Fioravanti, Allentown, Pa.; Larry S. Zelson, Menlo Park, Calif., and Charles E. Baukal, Jr., Harleysville, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 28, 1989, Ser. No. 387,321
Int. Cl.[5] F23L *1/00*
U.S. Cl. 431—116 8 Claims



1. A nozzle-mixed oxy-fuel burner comprising in combination:

a solid body having a first or flame face and a second or utility face disposed generally parallel to and spaced apart from said flame face;

an oxidant passage in said body extending inwardly from said flame face toward said utility face and communicating with means extending from said utility face toward said flame face to introduce oxidant into said oxidant passage;

at least one fuel passage entering said body on said utility face and communicating with said oxidant passage at said flame face said fuel passage including means to introduce fuel into said fuel passage;

means disposed in said oxidant passage to reduce oxidant velocity, cause redistribution of oxidant and promote uniform concentration of oxidant across said oxidant passage while simultaneously imparting a swirling motion to said oxidant stream; and

at least one recirculatory passage to, when said burner is in use, withdraw products of combustion through said burner flame face and recirculate said products of combustion through said oxidant passage toward said flame face.

4,954,077

GAS LIGHTER

Takemi Tamura, 3-12-1 Bubaicho, Fuchushi, Tokyo 183, Japan

Filed Sep. 28, 1988, Ser. No. 250,832
Int. Cl.[5] F23Q 2/00
U.S. Cl. 431—145 10 Claims

1. A fragrance emitting gas lighter comprising:

(a) a hermetically sealed gas container containing a liquefied, deodorized and purified butane gas and about 0.1 to 10% by weight perfume to said liquefied, deodorized and purified butane gas and wherein said perfume is selected from the group consisting of limonene, lemon oil, orange oil, grapefruit oil, lime oil, bergamot oil, methyl isobutyrate, ethyl n-butyrate, ethyl caprylate, ethyl propionate, ethyl isovalerate, ethyl-2-methyl butyrate, isoamyl acetate, isoamyl isovalerate, isoamyl n- butyrate, n-butyl isovalerate, ethyl acetoacetate, cis-3-hexenyl isovalerate, linalyl acetate, citronellyl acetate, geranyl acetate, cinnamyl acetate, benzyl acetate, citral, carvone and solid fragrances of strawberry, green apple, lemon and jasmine;

(b) a perfume solvent contained in said container;

(c) an injection nozzle connected through a hermetically sealed passage to said gas container;

(d) a valve connected between said injection nozzle and said hermetically sealed passage;

(e) a spark ignition means disposed adjacent to said injection nozzle;

(f) means for opening and closing said valve to release said liquefied, deodorized and purified butane gas and said perfume combination to provide the release of fragrance from said gas container; and

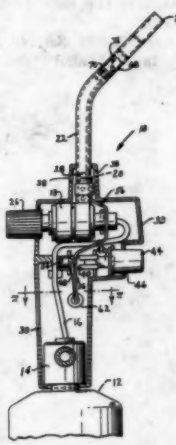
(g) means for activating said spark ignition means to ignite and burn said liquefied, deodorized and purified butane gas and said fragrance.

4,954,078

SPARK IGNITER SYSTEM

John M. Nelson, Brockport, N.Y., assignor to Newell Companies, Inc., Freeport, Ill.

Filed Mar. 14, 1986, Ser. No. 839,901
Int. Cl.[5] F23Q 3/00
U.S. Cl. 431—255 6 Claims



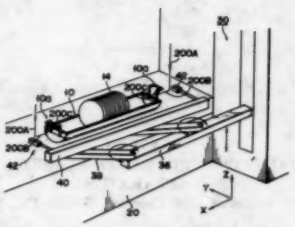
1. A portable gas hand torch assembly comprising a burner tube and a gas delivery means for directing a flammable gas mixture through said burner tube, said torch assembly further comprising a spark igniter circuit which includes a piezoelectric voltage source, a first conductor, a second conductor and a third conductor, said first conductor being electrically connected to one side of said voltage source, said second conductor being electrically connected to the other side of said voltage source, and said first and second conductors each having a portion thereof spaced from opposite ends of said third conductor for providing a first spark gap between said first and third conductors and a second spark gap between said third and second conductors, said first conductor and said third conductors comprising an electrically conductive wire and each wire being encased in electrical insulation except at the ends thereof, and two of said ends being spaced from each other at a minimum distance determined by said electrical insulation for providing said first spark gap between said two ends, said second spark gap being disposed in the path of said flammable gas mixture whereby voltage from said voltage source will generate a spark at said second spark gap to ignite the flammable gas mixture.

4,954,079

HEAT-TREATING APPARATUS AND A METHOD FOR THE SAME

Kenichi Yamaga, Sagamihara, Japan, assignor to Tel Sagami Limited, Kanagawa, Japan

Filed Feb. 3, 1989, Ser. No. 395,645
Claims priority, application Japan, Feb. 5, 1988, 63-25505
Int. Cl.[5] F27D 5/00
U.S. Cl. 432—6 5 Claims



1. A heat-treating apparatus, comprising:

a plurality of heat-treating furnaces arranged in multiple stages and boat supporting units installed near the entrances of the heat-treating furnaces;

a work position, provided adjacent to the heat-treating furnaces, for receiving a boat carrying objects to be heat-treated;

an elevator for transferring said boats between said work position and a predetermined said boat supporting unit; and

transfer means having a substantially cylindrical body to accomodate a boat carrying objects to be treated and a long slot, formed in the bottom part of said substantially cylindrical body, through which said boat supporting unit comes in and goes out for bringing said boats from said boat supporting units into specified ones of said heat-treating furnaces and bringing said boats back to said boat supporting units.

4,954,080

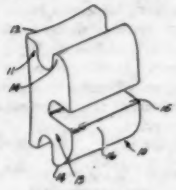
CERAMIC ORTHODONTIC APPLIANCE

John S. Kelly, Temple City, and Henrick K. Gille, Van Nuys, both of Calif., assignors to Unitek Corporation, Monrovia and Ceradyne, Inc., Costa Mesa, both of, Calif.

Continuation of Ser. No. 861,240, May 8, 1986, abandoned. This application Sep. 21, 1988, Ser. No. 248,297
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—8 43 Claims

35. A translucent orthodontic appliance for coupling to a tooth surface, formed of a single phase, self-bonded, polycrystalline ceramic having substantially randomly oriented crystals with an average grain size larger than the wavelength of visible

light and no more then ten percent of the thickness of the thinnest section of the appliance, said crystals scattering visible light passing through said appliance while having an in-line transmittance of visible light of at least 20% through 0.5 millimeter thickness of ceramic for minimizing backscattering of



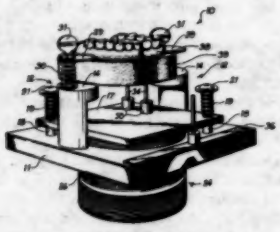
said visible light, whereby said visible light passing through said appliance is reflected from said tooth surface and retransmitted back through said appliance for emission therefrom, wherein said appliance substantially assumes a color corresponding to said tooth surface.

4,954,081

DENTAL DOWEL PIN REMOVAL METHOD AND APPARATUS

Barkley B. Williams, 316 Concord Woods Dr., Smyrna, Ga. 30080

Filed Dec. 2, 1988, Ser. No. 279,027
Int. Cl.[5] A61C *19/00*
U.S. Cl. 433—53 **13 Claims**



1. An apparatus for simultaneously separating segments of a dental cast from their plaster base wherein the segments are mounted to the base with pins positioned within holes that extend through the base, said apparatus comprising:

a platform;

mounting means for mounting, the base in a predetermined position spaced from said platform;

pin engaging means adapted to be positioned upon said platform and aligned for insertion into the holes of a base located at said predetermined position; and

means for moving said predetermined position and said platform toward each other,

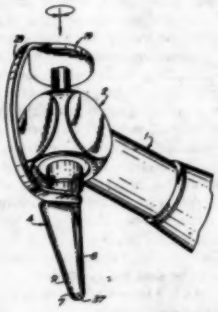
whereby the pin engaging means engages the dental cast pins upon relative movement of the platform and base to dislodge the pins and separate the dental cast segment from the base.

4,954,082

RECIPROCATING DENTAL TOOL

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Apr. 8, 1988, Ser. No. 179,332
Int. Cl.[5] A61C *17/02*
U.S. Cl. 433—80 **17 Claims**



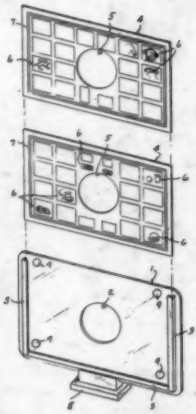
1. In a dental device comprising reciprocating drive means, a sleeve member operatively connected to the drive means for reciprocating motion, and designed to retain a dental tool, and a dental tool having a shank and a blade portion and being retained ins aid sleeve by said shank, the improvement comprising an internal channel extending axially along a central portion of the shank, and a plenum chamber within the blade portion in fluid flow connection with the shank channel, outlet openings through the blade surface, and pressure means and closure means for the shank channel, operable to force any fluid material within the channel and plenum out through the outlet openings.

4,954,083

COMMUNICATION AID

Ruth B. Leff, and Aaron N. Leff, both of 6589 N. Crestwood Dr., Glendale, Wis. 53209

Filed Aug. 17, 1989, Ser. No. 394,965
Int. Cl.[5] G09B *21/00*
U.S. Cl. 434—112 **15 Claims**



15. A communication aid for a handicapped patient, comprising a panel having a central opening therein, a plurality of overlay sheets each having a central aperture therein, mounting means on said panel for individually and removably mount-

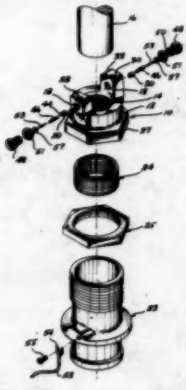
ing each sheet in general flatwise relation to the panel with the aperture being aligned with said opening, and a plurality of symbols disposed around the aperture of each sheet, the symbols on one sheet being different than the symbols on the other sheets, wherein with a sheet mounted on said panel an observer looking through the aligned opening and aperture can follow the eyes of the patient to determine the symbol at which the patient's eyes are directed.

4,954,084

SHAFT-GROUNDING STUFFING BOX COVER

John F. Pugh, Bellevue, and Ann L. Magallanes, Redmond, both of Wash., assignors to Marine Hardware, Inc., Redmond, Wash.

Filed Sep. 6, 1989, Ser. No. 404,286
Int. Cl.[5] H01R *39/00, 4/66*
U.S. Cl. 439—29 **14 Claims**



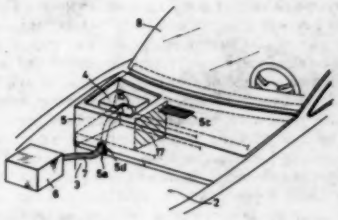
1. A stuffing box cover comprising:
a ring member having an aperture dimensioned to accommodate a rotating shaft extending therethrough and adapted for attachment to a stuffing box housing so as to form a liquid-tight seal around the rotating shaft; and
a grounding assembly integral with said ring member having a conductive brush that contacts the rotating shaft so as to provide a conductive path to it and to allow substantially free movement of the rotating shaft, said grounding assembly including
a brush holder attached to said ring member and spaced apart from the rotating shaft, said brush holder having an opening radially disposed relative to the rotating shaft, said conductive brush being seated within said opening and directed toward the rotating shaft, and biasing means for urging said conductive brush into conductive contact with the rotating shaft, said biasing means comprising a fastener secured within said opening and a spring means disposed within said opening extending between said fastener and said conductive brush.

4,954,085

WIRING STRUCTURE

Toshihiro Inoue, and Kazuhiro Ozawa, both of Utsunomiya, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,066
Claims priority, application Japan, Jul. 24, 1987, 62-183689; Jul. 24, 1987, 62-183690; Jul. 31, 1987, 62-190382; Jul. 31, 1987, 62-190383; Jul. 31, 1987, 62-190384
Int. Cl.[5] H01R *33/74*
U.S. Cl. 439—34 **10 Claims**



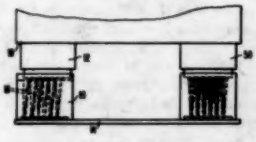
1. A wiring joint structure in a vehicle, comprising:
a connector guide having an end mounted to a partition wall, bounding an indoor side and an outdoor side of the vehicle, penetrating through a hole formed in said partition wall, said connector guide having a clip-like projection for temporarily fixing said connector guide to said partition wall;
a first connector positioned opposite to said end of the connector guide;
a second connector positioned within said connector guide to receive said first connector, said second connector slidably supported by said connector guide;
a bolt member provided rotatably on said first connector; and
a nut member fixed to said second connector as directed in a sliding direction thereof;
wherein making the first and second connectors butt against each other in a predetermined positional relationship and rotating said bolt member, said bolt member is threadedly inserted into said nut member, said second connector slides along said connector guide, and connect elements provided in respective connectors are therein connected with each other.

4,954,086

FLOAT/GUIDE MEMBER FOR CARD EDGE CONNECTOR

Edward W. D. Hill; William P. Buckley, both of Toronto, and Robert Hennessey, Ajax, all of Canada, assignors to Burndy Corporation, Norwalk, Conn.

Filed Jun. 21, 1989, Ser. No. 370,590
Int. Cl.[5] H01R *13/629*
U.S. Cl. 439—65 **4 Claims**



1. A one-piece float/guide member for directly connecting a

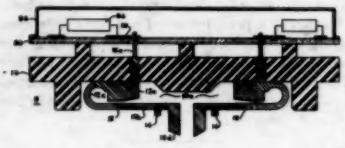
daughter printed circuit card to a motherboard, said float/-guide member having a transverse plane, comprising an insulative body member, said body member being defined by top, bottom, front, rear and side walls, a plurality of contact receiving cavities provided in said body member, each contact receiving cavity communicating with at least one first opening in said top wall, each of said contact receiving cavities communicating with a second opening in said bottom wall, a card edge connector having a plurality of thinned and lengthened pin contact members associated with said top wall, a pair of parallel upstanding rail members provided on said top wall for limiting movement of said connector perpendicular to the transverse plane of said body member, each of said contact members being received in said body member through a respective one of said first openings so as to extend within a respective one of said contact receiving cavities and to project from a respective one of said second openings and directly engage to said motherboard, said first openings being oversized with respect to said contact members, each of said contact receiving cavities having a first portion proximate said second opening for snugly receiving the contact member and a second portion extending from said first portion to said first opening which is enlarged with respect to said contact member, said daughter printed circuit board being associated with said card edge connector such that said daughter printed circuit board may be associated with a second card edge connector by floating said first card edge connector with respect to said float/guide member in the lateral direction on its contact members by allowing said contact members in said enlarged portion to bend, said daughter printed circuit board floating as a unit.

4,954,087

STATIC-FREE INTERROGATING CONNECTOR FOR ELECTRIC COMPONENTS

Imants R. Lauks, Morrisville, Pa., and Michael P. Zelin, Plainsboro, N.J., assignors to I-Stat Corporation, Princeton, N.J.

Continuation of Ser. No. 187,665, Apr. 27, 1988, abandoned.
This application Mar. 2, 1990, Ser. No. 489,844
Int. Cl.[5] H01R *9/09, 13/648*
U.S. Cl. 439—71 **13 Claims**



1. A connector for contacting an electric component comprising:

a housing including means for locating said component in a specified physical relationship to said housing;

a plurality of contact members carried by and biased with respect to said housing so as to be urged into physical contact with a predetermined electric component in said specified physical relationship to said housing;

conductor means located such that at least some of said biased contact members are urged into electrically conductive relation with said conductor means when no electric component is in said specified physical relationship to said housing, and such that selected contact members are displaced out of their electrically conductive relation to said conductor means when an electric component is in said specified physical relationship to said housing, different combinations of said contact members being displaced by different electric components; and

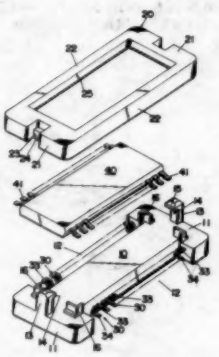
means connected to said contact members for determining the combination of displacements of said contact members when an electric component is in said specified physical relationship to said housing, and for identifying the component responsive thereto.

4,954,088

SOCKET FOR MOUNTING AN IC CHIP PACKAGE ON A PRINTED CIRCUIT BOARD

Tsutomu Fujizaki, Yokohama, and Minoru Shibata, Matsuzaka, both of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 16, 1990, Ser. No. 480,908
Claims priority, application Japan, Feb. 23, 1989, 1-44611; Sep. 26, 1989, 1-112424[U]
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—73 **9 Claims**



1. A socket adapted for mounting on a printed circuit board an IC chip package having a plurality of sideward extending leads comprising:

an elongated socket body of electrically insulating material;

a plurality of contact elements carried by said socket body to be aligned along the length thereof;

a cover frame of electrically insulating material fitted on said socket body in order to press said IC chip leads against the corresponding ones of said contact elements for positive electrical connection therebetween;

each of said contact elements comprising a base and an anchor leg at one end of said base, the other end of said base extending laterally and being bifurcated to form a vertically spaced pair of a spring leg for contact with the corresponding one of said IC chip leads and a terminal leg for connection with a circuit on said printed board, said contact elements fixed to said socket body with said anchor leg fixed to the lateral center portion of said socket body in such a way as to project said spring leg and terminal legs laterally outwardly of said socket body and to form an open space between said spring and terminal legs; and

said socket body provided at its longitudinal ends with catch means for detachably engagement with the corresponding ends of said cover frame for supporting said cover frame in position on said socket body.

4,954,089

TERMINATOR ASSEMBLY FOR INTERCONNECTING COMPUTER DEVICES

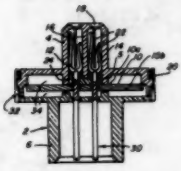
William T. Jensen, Mundelein; Vincent B. Brown, Prospect Heights; Cathy J. Edgerton, Barrington, all of Ill., and Robert W. Masterson, Denver, Colo., assignors to Methode Electronics, Inc., Chicago, Ill.

Division of Ser. No. 572,173, Jan. 18, 1984, Pat. No. 4,857,002. This application Sep. 8, 1989, Ser. No. 404,694

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] H01R *9/09, 13/66*

U.S. Cl. 439—76 **6 Claims**



1. In an assembly for providing code compatibility between a computer and peripheral devices, and including a housing for supporting a plurality of electrical contact members, said housing defining a plurality of openings at one end thereof to form a female receptacle, each of said electrical contact members having one end which is disposed within one of said openings to provide electrical contact with a male pin that is inserted into the respective opening, the improvement comprising, in combination:

a circuit board formed of insulative material and defining a plurality of holes therethrough;

an electrically conductive plating extending through said holes;

a resistor network carried by said circuit board, said resistor network comprising thick film polymer resistors connected to said conductive plating in a selected array;

said electrical contact members extending through said plated holes, whereby said housing, electrical contact members and said circuit board form a compact, unitary assembly;

said assembly also including a second male housing member which is connectable to said female receptacle to form an assembly comprising a female receptacle on one side of said circuit board and a male plug on the opposite side of said circuit board, said electrical contact members projecting through said plated holes in said circuit board and through corresponding openings in said second male housing member to form male pins at the side of said circuit board opposite from said female receptacle.

4,954,090

ELECTRIC CONNECTION BOX

Eiji Shimochi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,227

Claims priority, application Japan, May 31, 1988, 63-131708

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—76 **6 Claims**

1. In an electric connection box of the type having a pair of upper and lower cases connected together to provide a casing, at least one of said upper and lower cases having an electrically insulating housing; a wiring assembly accommodated within said casing and including an electrically insulating plate and a plurality of bus bars mounted on said insulating plate; and external connection terminals electrically connected to said bus bars and having respective contact portions received within said insulating housing;

the improvement comprising, each of said external connection terminals including a base portion fixed to said one case, a plurality of said contact portions formed on one lateral edge of said base portion and extending into said housing, and a bus bar-griping portion formed on the other lateral edge of said base portion and press-fitted to a said bus bar, and wherein each bus bar includes a bent

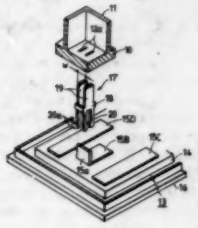


plate portion disposed substantially vertically for receiving said bus bar-gripping portion, in which said external connection terminal has two said bus bar-gripping portions press-fitted relative to at least one of said bus bars, respectively.

4,954,091

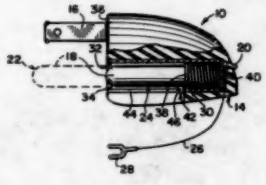
CONVERTIBLE GROUND SAFETY PLUG

Steven C. Marble, 330 S. Washington, and Gary D. Marble, 304 W. Grand, both of Neosho, Mo. 64850

Filed Dec. 14, 1989, Ser. No. 450,540

Int. Cl.[5] H01R *4/66*

U.S. Cl. 439—103 **1 Claim**



1. A convertible ground safety plug in combination with a three conductor power cord, comprising:

(a) an insulated housing;

(b) a pair of power prongs securely embedded in said housing electrically connected to two of the conductors and projecting outwardly from said housing;

(c) a grounding prong carried in said housing electrically connected to the third conductor;

(d) means for moving said grounding prong between an active position projecting outwardly from said housing and an inactive position not projecting outwardly from said housing so that said plug can be utilized for a three slot receptacle and a two slot receptacle to complete an electrical circuit, said moving means including a conductive general cylindrical sleeve having an open end with an internal retaining lip therein, said sleeve embedded in said housing so that said retaining lip is in alignment with the end of said housing having said power prongs projecting outwardly therefrom and electrically connected to the third conductor, said grounding prong having an enlarged ring on an inner end adapted to slide within said sleeve so that when said ring contacts said retaining lip it will prevent said grounding prong from disengaging from said sleeve, and a spring mechanically and electrically secured between the interior of said sleeve and said ring on said grounding prong to provide electrical contact between

the third conductor and said grounding prong, said spring being of sufficient resilience to independently, automatically maintain said grounding prong in its outwardly projecting active position when said plug is inserted into the three slot receptacle and automatically allowing said grounding prong to retract to its inactive position within said sleeve when said plug is inserted into the two slot receptacle;

(e) a wire with a "C"-shaped connector on one end and electrically connected at the other end to the third conductor so that said connector can be attached to a ground screw when said plug is utilized for the two slot receptacle to ground said plug; and

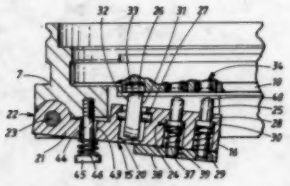
(f) means for locking said grounding prong in its outwardly projecting active position before said plug is inserted into the three slot receptacle, said locking means including said sleeve having a longitudinal slot therein, and a locking tab extending from the side of said grounding prong adjacent said enlarged ring on the inner end thereof so that said grounding prong can be turned to place said locking tab in alignment with said slot to allow said grounding prong to go into its retracted inactive position and to place said locking tab out of alignment with said slot to lock said grounding prong in its outwardly projecting active position.

4,954,092

ELECTRICAL CONTACT UNIT

Rolf G. Fransson, Angered; Bertil E. Jansson, deceased, late of Askim, and Magnus Jannson, Administrator, Jönköping, all of Sweden, assignors to Victor Hasselblad Aktiebolag, Göteborg, Sweden

Filed Sep. 15, 1988, Ser. No. 244,904
Claims priority, application Sweden, Sep. 15, 1987, 8703553
Int. Cl.[5] G03B *17/14*
U.S. Cl. 439—152 **9 Claims**



1. Electrical contact unit for electrically connecting a first main member, having a generally planar first supporting surface, with a second main member, having a generally planar second supporting surface, the second main member being mountable on the first main member, in which:

the first main member comprises a contact cradle, which exhibits a generally planar outer cradle surface and comprises first electrical contacts and a supporting member, which extends from the outer cradle surface;

the second main member comprises second electrical contacts and is provided with a receiving recess;

the contact cradle is rotatably journalled on a cradle axle;

the second main member assuming:

a first mounting position, in which the first supporting surface is parallel to and is located immediately adjacent to the second supporting surface, and the rolling/sliding member lies against the second supporting surface, the contact cradle thereby assuming a retracted position, in which none of the first electrical contacts is in physical contact with the second main member, and

a second mounting position, in which the first supporting surface is parallel to and is located immediately adjacent to the second supporting surface, the supporting member being located in the receiving recess, the contact cradle thereby assuming a contact position, in which each of the first electrical contacts is in contact with a corresponding one of the second electrical contacts;

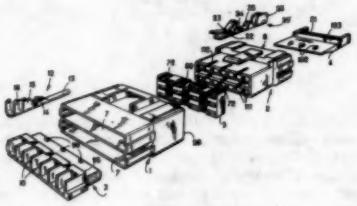
and in which the second main member moves from the first mounting position to the second mounting position and vice versa by the two main members being rotated relative to one another.

4,954,093

SHUNT CONNECTION DEVICE FOR ELECTRICAL CONNECTORS

Leonard Nadin, L'Union, France, assignor to Labinal, Montigny le Bretonneux, France

Filed Apr. 27, 1989, Ser. No. 343,603
Claims priority, application France, May 11, 1988, 8806397
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—188 **14 Claims**



1. A shunt connection device for an electrical connector, said electrical connector comprising a first casing member, a plurality of male contact members each incorporating a tang, a series of housings in said first casing member each adapted to receive a respective male contact member, a second casing member complementary to said first casing member, a plurality of female contact members each adapted to cooperate with a tang on a respective male contact member to make an electrical connection and a series of housings in said second casing member each adapted to receive a respective female contact member; said shunt connection device comprising a plurality of electrical connection channels each adapted to have a tang pass through it and a shunt module adapted to receive said electrical connection channels and comprising an insulative material body and a series of passages adapted to coincide with the respective housings of said first casing member and to receive a respective electrical connection channel, in which shunt module at least two of said electrical connection channels are electrically interconnected to provide a shunt connection, the connector further comprising a skirt on one casing member adapted to receive said shunt module.

4,954,094

SLIDING GIMBAL CONNECTOR

James C. Humphrey, Russell, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1989, Ser. No. 407,826
Int. Cl.[5] H01R *13/64*
U.S. Cl. 439—247 **6 Claims**

1. A gimballed electrical connector comprising;

a. a first hollow mounting frame having an inner surface and an outer surface;

b. at least one mounting member on said outer surface;

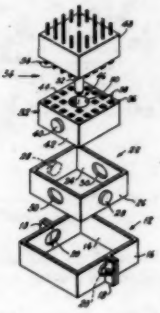
c. a pair of oppositely disposed stud receiving slots formed on said first frame inner surface, said pair of slots being elongated;

d. a second hollow mounting frame having an inner surface and an outer surface;

e. a pair of oppositely disposed cylindrical studs projecting from said second frame outer surface and engaging said

first pair of slots formed on the inner surface of said first mounting frame when said second frame is mounted within said first frame;

f. a pair of oppositely disposed protuberance receiving slots formed in said second frame inner surface, said pair of protuberance receiving slots being elongated and being formed in surfaces adjacent to and orthogonal to said second frame outer surfaces carrying said cylindrical studs; and



g. a first half of an electrical connector mounted within said second hollow mounting frame, said first half of said electrical connector comprising a body carrying electrical contacts, a pair of opposite disposed cylindrical protuberances on body outer walls which engage said pair of oppositely disposed protuberance receiving slots, said body further having a surface transverse to said body outer walls, said transverse surface carrying connector aligning means for aligning the second half of said connector.

4,954,095

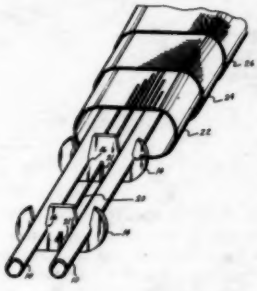
CABLE EMPLOYING TUBULAR CONDUCTORS

Kenneth L. Cogan, 1609 Young St., Cincinnati, Ohio 45210

Filed Mar. 1, 1989, Ser. No. 317,631

Int. Cl.[5] H01R *25/00*; H01B *11/00*; H02G *15/02*

U.S. Cl. 439—284 **2 Claims**



1. In combination a cable and a nonconductive terminal plug for use in a high-fidelity sound or video system for making electrical connection with a conventional female connector of the type having a central internal connection port and a conductive external cylindrical surface projecting thereabout and insulated therefrom,

said cable comprising

a first and a second cylindrical tubular conductor, said first conductor being of such outer diameter as to fit within and make conductive contact with the internal connection port of a conventional female connector, and

means to hold said conductors spaced apart and provide a dielectric between them, and

said nonconductive terminal plug,

including outer and inner end faces, a cylindrical cavity extending inward from said outer end face and sized to receive the cylindrical surface of the female connector, the cavity terminating short of said inner end face,

there being a first longitudinal bore through said plug inner end face aligned with the axis of the cavity,

and a second longitudinal bore through said plug inner end face, parallel to the first bore, said second bore being at a spacing from the first bore substantially equal to the radius of the cavity plus the greater part but not all of the radius of said second tubular conductor whereby said second bore intersects with and interrupts the cylindrical cavity wall,

said bores being of such diameter as to receive and hold said tubular conductors,

one of said tubular conductors extending through said first bore and along the axis of said cavity and projecting outwardly therefrom beyond said outer end face,

the second of said tubular conductors extending through said second bore substantially to but not beyond the outer end face of said body, with its side surface exposed at and along said interruption of the cavity wall,

whereby the exposed portion of the side surface of said second conductor makes conductive contact with the external cylindrical surface of such female conductor as the projecting end of said first conductor is inserted into and makes conductive contact with the central connection port of such female conductor.

4,954,096

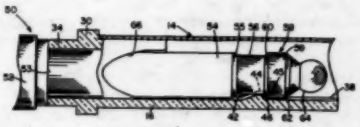
ELECTRICAL JACK WITH FIXED DETENT

John J. Frank, Chicago, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Continuation of Ser. No. 318,095, Mar. 2, 1989, abandoned. This application Feb. 8, 1990, Ser. No. 477,135

Int. Cl.[5] H01R *4/50*

U.S. Cl. 439—346 **13 Claims**



1. An electrical jack housing comprising:

a dielectric box-like enclosure having an end wall provided with aperture means for permitting an electrical jack plug to be inserted through said end wall and along a predetermined path in said enclosure, said aperture means including an aperture extended axially through the thickness of said end wall and communicating with the interior of said enclosure, said aperture being surrounded by a sleeve with flexible wall means for yielding resiliently to permit angular disposition of said plug in said sleeve relative to the axial centerline of said aperture; and

said enclosure having side wall means disposed substantially orthogonal to said end wall and extended along said predetermined path for supporting fixedly in said path rigid retaining means, said retaining means being disposed for releaseably engaging a portion of said jack plug and rigidly resisting withdrawal of said jack plug from said enclosure, said side wall means including a side wall of said enclosure having an inner surface portion disposed in alignment with said aperture, said side wall comprising a guide channel extending along said predetermined path,

said retaining means comprising a rigid projection having a sloped surface extending integrally from said side wall in said channel wherein, during insertion of said plug in said guide channel along said predetermined path, said plug slides up said sloped surface of said rigid projection to an angle with respect to said axial centerline of said aperture and said side wall, said sleeve resiliently yielding and maintaining resiliently opposing pressure on said plug.

4,954,097

CONNECTOR PLUG WITH LOCKING MECHANISM

Shigemi Sekiguchi, Kiryu, Japan, assignor to Hosiden Electronics Co. Ltd., Osaka, Japan

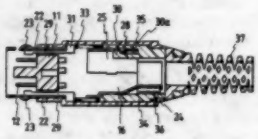
Filed Sep. 6, 1989, Ser. No. 403,511

Claims priority, application Japan, Sep. 21, 1988, 63-124293[U]

The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.

Int. Cl.[5] H01R *13/627*

U.S. Cl. 439—352 **6 Claims**



1. A connector plug with a locking mechanism comprising:

an insulating body made of a resin material and carrying pin contacts;

a metal cover composed of a cylindrical front half portion and a semi-cylindrical rear half portion, said cylindrical portion housing said insulating body and having at least one tongue-shaped locking piece which has a projection and extends forward in the axial direction of said metal cover;

a metal clamper attached to the rear end of said metal cover, for clamping a cable;

an elastic support piece made of a resin material and mounted in said metal cover in a manner to be axially slidable on the inner surface of said tongue-shaped locking piece, said elastic support piece having an actuating member at the rear end thereof;

a semi-cylindrical metal auxiliary cover for covering said semi-cylindrical rear half portion of said metal cover;

a coiled spring mounted around said metal cover, a front end portion of said coiled spring urging said actuating member forwardly to bias said elastic support piece forwardly;

a cap of a resin material into which said semi-cylindrical rear half portion and said auxiliary cover are inserted, for holding the entire connector plug structure; and

a tubular member of a resin material for covering said entire connector plug structure, said tubular member having a portion which engages said actuating member to slide said elastic support piece rearwardly when said tubular member is pulled rearwardly.

4,954,098

SEALED INSULATION DISPLACEMENT CONNECTOR

Elmont E. Hollingsworth, and Gary W. Schlaeger, both of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 1, 1989, Ser. No. 430,863

Int. Cl.[5] H01R *4/24*

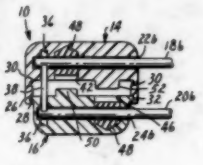
U.S. Cl. 439—404 **12 Claims**

1. A device for electrically connecting two or more wires, comprising:

a cap member having a first channel therein for receiving one of the wires, and having a first void therein in fluid communication with said first channel;

a base member having a second channel therein for receiving another one of the wires, and having a second void therein in fluid communication with said second channel, said base and cap members defining a clearance space, and each of said voids opening toward said clearance space;

sealing material in each of said voids;



contact means located within said cap member and said base member for providing an electrical connection between the wires;

a first piston extending from said cap member into said clearance space opposite said second void in said base member; and

a second piston extending from said base member into said clearance space opposite said first void in said cap member.

4,954,099

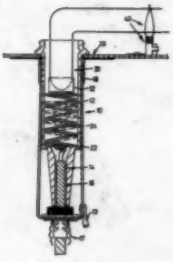
ELECTRODE RECEPTACLE

Wasyl Slowski; Darrel Slowski, both of Islington, and David Slowski, Mississauga, all of Canada, assignors to Williams Sign Supplies Ltd., Mississauga, Canada

Continuation of Ser. No. 923,198, Oct. 27, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 306,387

Int. Cl.[5] H01R *33/02*

U.S. Cl. 439—244 **15 Claims**



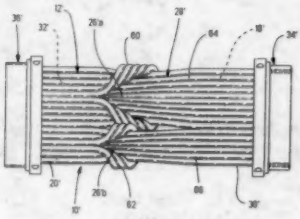
1. In an electrical receptacle having a generally hollow cylindrical section for receiving high tension wire means at one end and light means at another end, said light means adapted for electrical connection with said high tension wire means interiorally of said hollow cylindrical section, said hollow cylindrical section comprised of carbonate resin plastic for resisting sudden heat increases within said hollow cylindrical section in the region of said electrical contact with said light means and said high tension wire means wherein said carbonate resin plastic has a melt flow of 9 to about 12 g/10m at 300 degrees Centigrade and 1,200 g load and tensile stress at yield of 63 MPa, a tensile stress at break of 68 MPa, a deflection temperature under load at 1.8 MPa of 133 degrees Centigrade and a dielectric strenght of greater than 16 KV/mm.

4,954,100

RIBBON CROSSOVER CABLE ASSEMBLY AND METHOD

Earl W. McCleerey, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 1, 1989, Ser. No. 444,504
Int. Cl.[5] H01R *9/07*
U.S. Cl. 439—492 **9 Claims**



1. A ribbon crossover cable assembly, comprising:

a first ribbon cable, said first ribbon cable having conductors surrounded by insulation, first and second ends and an opening formed by a separation through a limited segment of said first ribbon cable between a centrally located pair of conductors, said first ribbon cable having said first end passed through the opening such that said first end is looped through said ribbon cable;

a second ribbon cable, said second ribbon cable having conductors surrounded by insulation and second ends, said first end passing through the opening in the first cable;

a first connector having contacts, said contacts terminated to respective ones of the conductors of the first and second cables at the first ends thereof; and

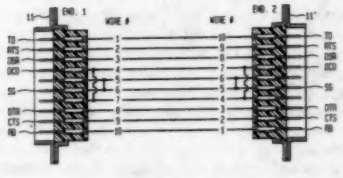
a second connector having contacts, said contacts terminated to respective ones of the conductors of the first and second cables at the second ends thereof.

4,954,101

IMPROVED CABLE FOR COUPLING BETWEEN DATA TERMINALS AND DATA SETS

Neal Nelson, 1019 S. Humphrey, Oak Park, Ill. 60304

Filed Jul. 6, 1989, Ser. No. 376,554
Int. Cl.[5] H01R *11/00*
U.S. Cl. 439—502 **14 Claims**



1. A data communications device for the transfer of data between data terminals and a data sets comprising:

at least one of a first data terminal and a first data set;

at least one of a second terminal and a second data set;

a first connector comprising a plurality of individual electrical leads operatively coupled to said at least one of a said first data terminal and a first data set;

a second connector comprising a plurality of individual electrical leads operatively coupled to said at least one of said second data terminal and second data set;

a cable means comprising a plurality of electrical wires for electrically connecting said first and second connectors;

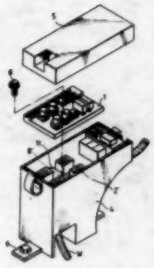
the total number of said plurality of electrical wires of said cable means being an even number; a first one of said wires of said cable means being permanently, physically and electrically coupled to a second one of said wires of said cable means; first bridge-connector means for electrically connecting said first and second ones of said wires; said second one of said wires of said cable means being an asymmetric one not having a paired wire associated therewith, whereby said cable means is made symmetric so that it may be used to connect at least one of a first data terminal and data set to said at least one of a second data terminal and a second data set.

4,954,102

WIRING CONNECTION APPARATUS

Keiichi Ozaki; Naoki Manabe; Tatsumi Shibata; Hideharu Hayashi; Yukio Muramatsu, and Masaki Yamamoto, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Mar. 22, 1989, Ser. No. 327,056
Claims priority, application Japan, Mar. 25, 1988, 63-69824
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—535 **9 Claims**



1. A wiring connection apparatus in which an electric connection box connected to connectors of terminals of wire harnesses is housed and fixed in a protecting cover, said apparatus comprising an improvement wherein a reception seat for fixing said electric connection box is fixed within said protecting cover, and a first lock means is provided between said reception seat and said connectors of the terminals of said wire harnesses so that said electric connection box and said connectors are simultaneously connected to each other when said electric connection box is fixed to said reception seat.

4,954,103

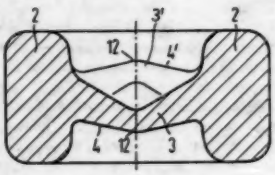
PRESS IN CONTACT ELEMENT FOR CIRCUIT BOARDS

Ernst Liebich, Geltendorf, Fed. Rep. of Germany, and Jacques Longueville, Oostkamp, Belgium, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Dec. 1, 1989, Ser. No. 444,749
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1988, 8815052[U]
Int. Cl.[5] H01R *13/428*
U.S. Cl. 439—751 **20 Claims**

1. A contact element having a pin-shaped section for being plugged into a bore of a printed circuit board, said pin-shaped section including two leg members extending side-by-side in a plug-in direction and merging into one another at their ends to provide transition zones and including a resilient section comprising at least one web extending between the leg members, said web having curved portions, the improvement comprising

said web being divided into at least two web portions following one another in a longitudinal direction of the pin-shaped



section with alternating web portions extending to respective opposite sides of the element.

4,954,104

PRESS-FIT ELECTRICAL TERMINAL

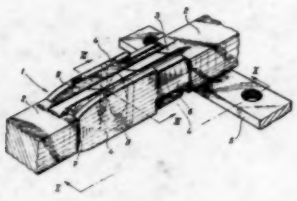
Egidius T. R. Thomassen, Maren-Kessel, Netherlands, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 328,882, Mar. 27, 1989, abandoned. This application Feb. 8, 1990, Ser. No. 477,179

Claims priority, application Netherlands, Nov. 30, 1988, 8802705

Int. Cl.[5] H01R *13/41*

U.S. Cl. 439—751 **7 Claims**



1. An electrical contact terminal for press-fit insertion into an opening in a substrate such as a circuit board wherein said terminal has a mounting section comprising an oblong base portion having an approximately elliptical cross-section and two separately formed flexible fins extending lengthwise in contact with two opposite surfaces of said base portion with the largest radius of curvature, said opposite surfaces being flattened in the area contacting the fins so that a longitudinal midsection of each fin extends in contact with each said flattened opposite surfaces of the base portion and a longitudinal free edge of each said fin extends away from said base portion, each said edge being rounded on a side facing away from the base portion, said fins being tapered and welded to the base portion at one end and clamped to the base portion at the other end.

4,954,105

REPLACEMENT CONNECTOR FOR IMPLANTED LEADS

Elmar R. Fischer, Lake Jackson, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed Dec. 28, 1989, Ser. No. 458,175

Int. Cl.[5] H01R *11/11*

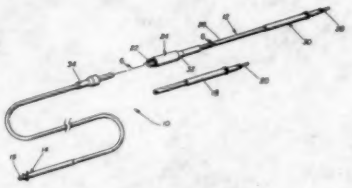
U.S. Cl. 439—864 **16 Claims**

1. A connector for replacement of a proximal end of an implanted lead, the connector comprising:

means for making an electrical connection with an electrical conductor in a severed end of the implanted lead from which the proximal end of the implanted lead has been removed;

means for securing a distal end of the connector to the severed end of the implanted lead;

terminal means at a proximal end of the connector for electrical connection to a medical device; and



conductor means electrically connecting the connection making means to the terminal means.

4,954,106

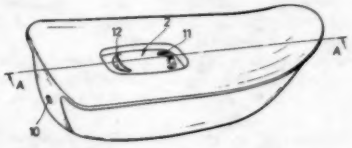
AQUATIC SPORTS DEVICE

Lin Shuh-Chin, No. 5, 35th Lane, 4th Alley, An-Lo Rd., Chung-Ho City, Taipei Hsien, Taiwan

Filed Feb. 8, 1989, Ser. No. 308,130

Int. Cl.[5] B63H *11/02, 16/00*

U.S. Cl. 440—21 **1 Claim**



1. An aquatic sports device, comprising:

(A) a buoyant body for buoyantly supporting a user above the surface of a body of water, said buoyant body having a forward end and a rear end, said buoyant body being formed of lightweight material, said buoyant body having a streamlined outer configuration; and

(B) moving means for moving said buoyant body and the user through the body of water, said moving means including:

(a) a cylindrical tank located within said buoyant body, said tank being located more toward said rear end of said body than said forward end;

(b) a first pipe connected to the bottom of said tank for conveying water from said tank and through said rear end of said buoyant body, said pipe including a nozzle located at said rear end;

(c) a circular piston which slides downwardly from an upper position within said tank under the weight of the user to force water from said tank, through said first pipe, and through said rear end of said buoyant body to move said buoyant body and the user through the body of water, said piston including an annular slot;

(d) a spring located within said tank for returning said piston upwardly to said upper position;

(e) a second pipe connected to the bottom of said tank for conveying water from said forward end of said buoyant body and into said tank as said piston is returned to said upper position by said spring;

(f) a first one-way valve for preventing water from passing from said rear end of said buoyant body and through said first pipe as said piston moves upwardly, said one-way valve being located at an end of said first pipe;

(g) a second one-way valve for preventing water from passing out of said tank and through said second pipe as

said piston moves downwardly, said second one-way valve being located at an end of said second pipe; and

(h) a seal ring for preventing water from leaking from said tank and past said piston, said seal ring being received within said annular slot of said piston.

4,954,107

TILT CYLINDER DEVICE

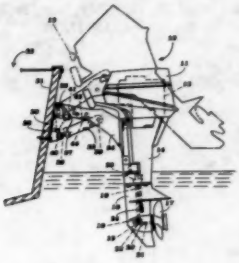
Yukio Sumigawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 13, 1989, Ser. No. 365,665

Claims priority, application Japan, Jun. 13, 1988, 63-143504

Int. Cl.[5] B63H *5/12*

U.S. Cl. 440—61 **20 Claims**



1. An outboard drive unit carrying propelling means for propelling a marine vessel having a hull through the water, said outboard drive unit further comprising, a clamp bracket attached to the hull of said vessel, a tilt shaft, a swivel bracket rotatably secured to said clamp bracket by said tilt shaft about a tilt axis, a stop pin secured to said clamp bracket for setting the downward position of said swivel bracket, and a tilt cylinder device pivotally connected at one end to said swivel bracket and pivotally connected at the other end to said clamp bracket such that a line segment extending between said pivotal connections does not intersect any line segments extending between said tilt axis and the position where said stop pin is secured to said clamp bracket for decreasing the stress acting on the tilt cylinder device and its associated parts, said tilt cylinder device being adapted to maintain the drive unit in the downward position when the propelling means of the drive unit is operated in reverse.

4,954,108

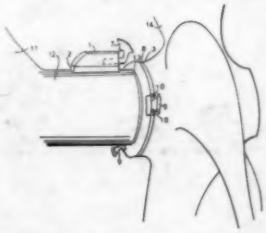
LINE CUTTER FOR MARINE PROPELLERS

Donald T. Govan, Box 350246, Fort Lauderdale, Fla. 33335

Filed Dec. 4, 1989, Ser. No. 444,997

Int. Cl.[5] B63H *1/28*

U.S. Cl. 440—73 **11 Claims**



1. An apparatus that cuts foreign matter including lines, wires, nets and weeds of the type that may be encountered by propeller driven vessels when under way, said vessels of the type where the propeller is mounted to a rotatable propeller shaft that extends from a propeller shaft housing connected to the vessel's hull, and in which there is negligible axial movement of said shaft, said apparatus comprising:

(A) at least one first blade means for cutting, said first blade means having a first shearing plane, said first blade means arranged to rotate in conjunction with said propeller with said first shearing plane substantially perpendicular to the axis of said shaft;

(B) first support means for supporting said first blade means in position extending radially and beyond said first support means to engage said foreign matter, said first support means including means for fixedly attaching to at least one member of the pair consisting of said shaft and said propeller;

(C) at least one second blade means for cutting, said second blade means having a second shearing plane, said second blade means arranged with said second shearing plane substantially parallel to said first shearing plane of said first blade means;

(D) second support means for supporting said second blade means in a position extending radially parallel to, and within shearing distance of, said first blade means to engage said foreign matter for shearing said foreign matter between said first and second blade means, said second support means for fixedly attaching to a non-rotating member of said hull;

(E) said first blade means and said second blade means each having radially extending, sharp edges at two margins of said shearing planes for cutting said foreign matter;

(F) said second support means supporting said second blade means in a pivotal structure arranged to permit said second blade means to pivot about a blade axis parallel to the axis of said shaft;

(G) a combination of a wedge means and a substantially V-shaped valley means for applying force to said second blade means for forcing said second blade means toward said first blade means when said second blade means pivots about said blade axis; and

(H) wherein one of said combination of said wedge means and said valley means is connected to said second blade means and the other is connected to said second support means.

4,954,109

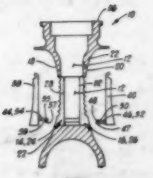
WATER PICKUP INSERT

Lee W. McMorries, IV, Stillwater, Okla., assignor to Brunswick Corporation, Fond du Lac, Wis.

Filed Jul. 20, 1989, Ser. No. 382,297

Int. Cl.[5] B63H *21/38*

U.S. Cl. 440—78 **15 Claims**



9. A cooling water pickup insert assembly for a marine outdrive, comprising:

a first cooling water pickup insert;

a second cooling water pickup insert; and

locking means, defined on said first and second inserts, for locking said first and second inserts together to hold said inserts in place on said outdrive, when said inserts are

pushed toward and engaged with each other through said locking means, with said outdrive sandwiched between said first and second inserts.

4,954,110

UNDERWATER BUOY PROVIDED WITH HYDRODYNAMIC STABILIZING MEANS AND DESIGNED TO BE SUSPENDED, NOTABLY FROM A HELICOPTER

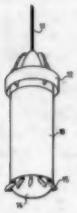
Francois Warnan, Trappes, France, assignor to Thomson-CSF, Puteaux, France

Filed Apr. 11, 1989, Ser. No. 336,058

Claims priority, application France, Apr. 12, 1988, 88 04829

Int. Cl.[5] B63B *22/18*

U.S. Cl. 441—22 **3 Claims**



1. An underwater buoy, provided with hydrodynamic stabilization means and designed to be suspended from a carrier vehicle by a cable, said buoy comprising a body, said body having a ring placed on the upper part of the body, fins placed on the lower part of the body, which get folded during the descent into the water so as to then have a substantially null effect, and get unfolded during the rising stage to stabilize the motion of the buoy by preventing the buoy from being made to rotate, wherein the fins extend substantially vertically and have a leading edge of which is pointed towards the bottom of the buoy, said buoy further comprising a ballast placed in the lower part of the body, said ballast being machined so that it is recessed from the circumference of the body, and being provided with joint features, located on its circumference, to hold fins.

4,954,111

SWIMMING FLIPPER MADE OF TWO DIFFERENT MATERIALS

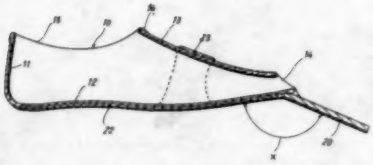
Leopoldo A. Cressi, Genoa, Italy, assignor to Cressi-Sub S.p.A., Genoa, Italy

Filed Oct. 28, 1988, Ser. No. 264,266

Claims priority, application Italy, Nov. 30, 1987, 12591 A/87

Int. Cl.[5] A63B *31/11*

U.S. Cl. 441—61 **6 Claims**



1. A swimming flipper comprising, a shoe made of a relatively resilient material and having a sole and an upper having a heel and open at the front for the toes of a wearer to extend therethrough, a blade made of a lesser resilient material than the shoe molded on the sole of the shoe extending forwardly of the shoe and having a portion thinner in thickness extending toward the heel of the shoe defining an outer sole of the shoe, said outer sole narrowing in width toward the heel of the shoe starting about half way along the length of the shoe and terminating at the heel of the shoe, the blade having opposite side edge ribs for stiffening thereof, and an arched outer strap extending over a front part of the shoe integrally joining the side edge ribs with each other, said outer strap being made of a material less resilient than the shoe and embedded therein.

4,954,112

FLIPPER FOR FLIPPER SWIMMING

Giovanni Negrini, Via Carlo Porta, 13, and Roberto Chiola, Via Talamone, 8, both of I 27029 Vigevano, Italy

Filed Mar. 30, 1989, Ser. No. 330,785

Int. Cl.[5] A63B *31/10*

U.S. Cl. 441—64 **2 Claims**

1. A swimming flipper comprising a shoe and a blade, said blade being formed from resin sheets of varying lengths interposed between resin sheets of longer length thereby forming a blade of stratified thickness, and said blade having rubber inserts longitudinally disposed along the length of said blade, said inserts being hot-pressed with said blade.

4,954,113

LIGHT BULB HAVING A MULTICOLORED DESIGN AND METHOD OF MANUFACTURING THEREOF

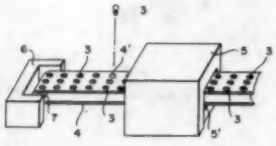
Young G. Kim, Oyang Apt. 3-505, Kwang-An 4-Dong Nam-ku, Pusan, Rep. of Korea

Filed Jun. 20, 1989, Ser. No. 368,608

Claims priority, application Rep. of Korea, May 9, 1989, 89-6146

Int. Cl.[5] H01J *9/20*

U.S. Cl. 445—58 **4 Claims**



1. A method for manufacturing a light bulb having a multicolored design which comprises the steps of:

(a) printing on a transfer film a multicolored design,

(b) attaching said transfer film with printed multicolored design onto the surface of a light bulb, and

(c) burning said light bulb with said transfer film with multicolored design attached thereto at a temperature of about 550°–650° C. for 1–2 hours so as to manufacture said light bulb having a multicolored design, said transfer film attached onto the surface of the light bulb being substantially burned away leaving said multicolored design in a burning chamber which contains a tunnel for passing a conveyor belt having a plurality of apertures for receiving a plurality of said light bulbs to be burned.

4,954,114

COMBINATION TOY WITH A COVER AND INNER MEMBERS

Atsuko Kawashima, 1641-28A, 3rd Ave., New York, N.Y. 10128

Filed Oct. 6, 1989, Ser. No. 418,201

Int. Cl.[5] A63H *33/04, 3/00, 33/00*

U.S. Cl. 446—75 **7 Claims**

1. A combination toy comprising:

a cover made of a flexible material and having a closing device at one side so that inside of the cover can be substantially completely disclosed when the closing device is opened, and at least one first engaging device fixed inside the cover at a side opposite to the closing device, and

a plurality of inner members removably disposed in the cover, each inner member having the same size and shape with each other, each inner member including a second engaging device at one side so that the inner member can be detachably attached to the first engaging device, a third engaging device at a side opposite to the second engaging device for detachably engaging another second engaging device so that the inner members can be detachably engaged with each other in any desired order, and a sign fixed onto the inner member, said signs of the inner members being different from each other to identify the respective inner members.

4,954,115

GAME CALL

Dru G. Metiva, 1945 19 Mile Rd., Marion, Mich. 49665

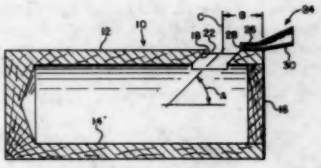
Filed Dec. 5, 1988, Ser. No. 279,858

Int. Cl.[5] A63H *5/00*

U.S. Cl. 446—204 **10 Claims**

1. A game call comprising:

a hardwood body including an internal chamber closed on opposite ends and a passage through a wall of said body angled at 45 degrees relative to the longitudinal axis of the chamber in a direction toward a flow of air directed across an inlet of said passage, said passage having a square outlet into said chamber; and



means on said body for directing the flow of air across said inlet.

4,954,116

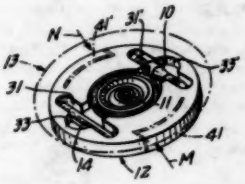
HAND-SPINNABLE TOP AND KIT THEREFOR

John Rubino, R.D. 2, Box 2721, Stowe, Vt. 08572

Continuation of Ser. No. 82,109, Aug. 6, 1978, abandoned. This application Mar. 24, 1989, Ser. No. 328,180

Int. Cl.[5] A63H *1/00*

U.S. Cl. 446—256 **14 Claims**



1. A spin-top comprising an elongate metal spindle having semispherical upper-end and lower-end profiles, said spindle having an enlarged hub portion between and offset from both end profiles, the lower end of said hub terminating in a downwardly facing radial shoulder, and said spindle having an externally threaded portion beneath and adjacent said shoulder and at relatively short offset from the lower end of said spindle; and a flywheel having an internally threaded bore, said flywheel being removably engaged via said bore to the threaded portion of said spindle, said flywheel having an outwardly facing circumferential groove with an elastomeric O-ring fitted to said groove, and said semispherical lower-end profile projecting beyond said flywheel when the latter is threaded into abutment with said shoulder, the extent of both spindle-end profile projections axially beyond said flywheel being such as to dictate non-spinning support of the top soley via said O-ring and either of the ends of said spindle.

4,954,117

SAWING ACTION FIGURE TOY

Camille Daleus, deceased, late of Montreal; by Ursule Dubreuille, legal representative, and by Régine Daleus, legal representative, both of 11,950 Grenet, Apartment 501, Montreal, all of Canada (H4J 2L6)

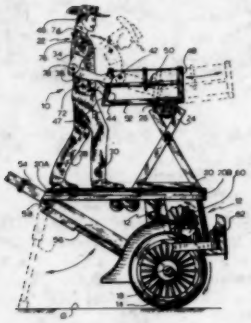
Filed Jun. 13, 1989, Ser. No. 365,540

Int. Cl.[5] A63H *11/12*

U.S. Cl. 446—280 **8 Claims**

1. An action comprising a main frame, a pair of wheels journalled to said frame by a shaft member for rollingly supporting said frame on a flat horizontal surface, a handle fixed to said frame, a hollow human figure defining feet, legs, a trunk, a head, arms, forearms, hands, a waist, a neck, shoulders, elbows, said feet being anchored to the rearward section of said frame so that said legs extend upwardly therefrom, a log an-

chored to the frontward section of said frame in substantially horizontal register with said hands, a bucksaw having a rear handle grasped by said hands and a lower generally horizontal blade slidingly engaging a groove made about a transverse section of said log; wherein said human figure includes waist, shoulders, neck, and elbows pivot members, for pivotal action thereabout; further including transmission means, to transmit



power from that induced by the continuous rotation of said shaft member, to actuate said pivot members concurrently and transform said continuous rotation into a reciprocating fore-and-aft motion of said arms and of said forearms relative to said arms, and into an alternating up-and-down motion of said trunk and of said head relative to said trunk; whereby apparent sawing of said log by the human figure with his bucksaw is effected by rolling the toy on said horizontal surface.

4,954,118

FLEXIBLE BODIED DOLLS

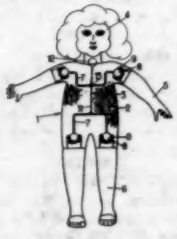
Jacques Refabert, St Cyr Sur Loire, France, assignor to Corolle S.A., France

Filed Sep. 28, 1989, Ser. No. 414,030

Claims priority, application France, Sep. 30, 1988, 88 12820

Int. Cl.[5] A63H *3/46, 3/02*

U.S. Cl. 446—375 **4 Claims**



1. A stuffed doll comprising a flexible body, rigid members and a frame embedded in the body, said frame having projecting portions in the form of at least partial balls capped with an easy fit by shells which are connected to the respective member, wherein the framework is in the form of at least one rod formed by a metal wire and having a cross section of between 3 and 13 mm^2, which rod extends along a sinous path in a generally "U" shape and terminates at at least one of its ends in a said ball.

4,954,119

SLIDING UNIVERSAL JOINT HAVING CYLINDRICAL HOLDER POSITIONING MEANS

Akira Sasaki; Seiji Esaki; Yasushi Hashimoto, and Shigeo Kurita, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

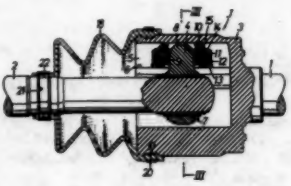
Filed Jun. 28, 1988, Ser. No. 212,535

Claims priority, application Japan, Jul. 1, 1987, 62-101633

The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.

Int. Cl.[5] F16D *3/205*

U.S. Cl. 464—111 **3 Claims**



1. In a sliding universal joint including a cylindrical outer member connected to one transmitting shaft and having an inner periphery formed with a plurality of transmitting grooves arranged circumferentially equally spaced from each other and extending axially, an inner member connected to another transmitting shaft and having a plurality of trunnions radially extending to project into said transmitting grooves, an inner roller slidably engaged with an outer periphery of each trunnion, a cylindrical holder having a spherical inner periphery relatively oscillatably engaging with a spherical outer periphery of each said inner roller, and an outer roller rotatably supported to an outer periphery of each said holder and engaged with the respective transmitting groove, wherein said spherical inner periphery of each said holder is formed with a pair of opposed cutouts for installing said inner roller into said holder;

the improvement comprising a positioning means provided between said holder and said outer member for positioning said holder so as to make the direction of arrangement of said pair of cutouts coincident with the longitudinal direction of said transmitting groove and retaining said pair of cutouts coincident with the longitudinal direction of said transmitting groove.

4,954,120

SLIDABLE CONSTANT VELOCITY JOINT

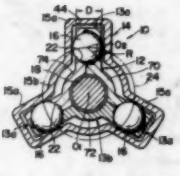
Katsuyuki Kobayashi, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 19, 1989, Ser. No. 299,066

Claims priority, application Japan, Jan. 25, 1988, 63-12485; Feb. 12, 1988, 63-28880

Int. Cl.[5] F16D *3/221*

U.S. Cl. 464—141 **7 Claims**



1. A slidable constant velocity joint comprising:

an inside part provided integrally with a first shaft and hav-

ing three first holding portions disposed spacedly apart circumferentially at equal intervals and extending radially and axially from the first shaft;

an outside part provided integrally with a second shaft and having three second holding portions disposed spacedly apart circumferentially at equal intervals, each second holding portion having a recess extending axially of the second shaft to receive said first holding portion; and

a rolling body disposed in said each recess so as to be in contact with the first holding portion of said inside part and the second holding portion of said outside part;

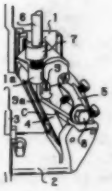
wherein said each first holding portion includes a concave surface being in contact with and holding in position said rolling body while said each second holding portion includes two planes being in contact with said rolling body and being parallel to an imaginary plane which includes an axis of the first shaft and a radius extending from said axis and passing through a center of said first holding portion which is received in said second holding portion in a direction orthogonal to said axis.

4,954,121

REAR DERAILLEUR FOR BICYCLES OR SIMILAR VEHICLES

Henri Juy, Dijon, France, assignor to Simplex, S.A., France

Filed Jul. 11, 1989, Ser. No. 378,322
Claims priority, application France, Jul. 12, 1988, 88 09758
Int. Cl.[5] F16H *11/00*
U.S. Cl. 474—82 **6 Claims**



1. A rear derailleur for bicycles and similar vehicles, of the type which comprises a top bracket (1) fixed to the bicycle and a bottom bracket (2) carrying a chain guide (3), these brackets (1) and (2) being connected by a linkage system (4–5) making a deformable parallelogram linked to an operating cable (C) integral with a lever, this cable working in conjunction with a fixed part (1*a*) of the derailleur, in particular the top bracket and a fixing point (8) on a moving part, wherein it has, at the fixed part which takes the cable, a facility (9) for moving at will the supporting and return point (A) of the cable to change the angle (α) which the cable makes so as to increase or reduce the extent of transverse movement of the parallelogram for the same extent of angular movement of the lever.

4,954,122

DIFFERENTIAL GEAR APPARATUS WITH WORM GEARS

Toshiyuki Nakao, and Naomichi Adachi, both of Chiryu, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 28, 1989, Ser. No. 329,676
Claims priority, application Japan, Mar. 31, 1988, 63-042110
Int. Cl.[5] F16H *1/38*
U.S. Cl. 475—160 **2 Claims**

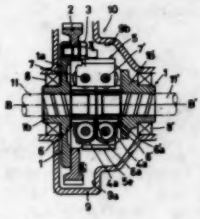
1. A differential gear apparatus, comprising:

a power source;

housing means for rotation about a predetermined axis when driven by said power source and including a lubricating oil reservoir;

worm gear means including first and second worm gears mounted in the housing means for rotation therein; and

an enlarged washer member disposed between the housing



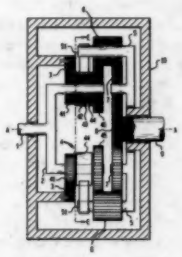
means and said worm gear means for guiding lubricating oil from the lubricating oil reservoir to the first and second worm gears against centrifugal force created by rotation of said housing means.

4,954,123

RADIAL HELIX DRIVE HORSE POWER AMPLIFIER

Eugens Kurywczak, 238 Murray St., Elizabeth, N.J. 07202

Filed Dec. 12, 1988, Ser. No. 282,512
Int. Cl.[5] F16H *1/32, 1/46*
U.S. Cl. 475—179 **5 Claims**



1. A radial helix drive horse power amplifier comprising a casing, in which means are provided to house a planetary gear train with an input and output power means, comprising a centrally positioned pinned ring gear, whose axis defines a system axis of rotation of a system instituting the said planetary gear train, concentric to the said system axis, a rotatable input shaft protruding outside the said casing providing means for connection with a power source and to which an input carrier is rigidly affixed and provides means to mount a rotatable compound iso-planet of one piece construction, comprising a planet gear, which meshes with the said pinned ring gear and to which, a larger by at least one tooth planet gear, whose teeth extend outward past the pitch radius of the said pinned ring gear and a hub are pinned to whose rim an angular rotation isolation system isolating its rotation around its center is bonded, comprising a bearing and a non-circular coupling, which is bonded to the outer rim of the said bearing and provides an isolated, by a frictionless agent of the said bearing, means of mating with the said iso-planet inward from the said pitch radius of the pinned ring gear, concentric to the said system axis an idler carrier is rotatably mounted and where at means are provided for a coupling mate, rigidly secured to the said idler carrier and mates with the said non-circular coupling of the iso-planet, making the said idler carrier slave to the tangential displacement of the said iso-planet, a rotatably mounted driver gear meshed with the said larger iso-planet

gear outward past the said pitch radius of the pinned ring gear and a rotatably mounted idler gear meshed with the said driver gear and concentric to the said system axis, an output sun gear, meshed with the said idler gear and rigidly affixed to a rotatable output shaft, which protrudes outside the said casing and provides means of connection with a load.

4,954,124

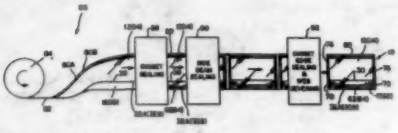
STAND-UP PLASTIC BAG AND METHOD OF MAKING SAME

Laurence R. Erickson; R. Douglas Behr, and Roger D. Vrooman, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 171,053, Mar. 21, 1988, Pat. No. 4,837,849. This application Jan. 30, 1989, Ser. No. 303,310

Int. Cl.[5] **B31B** *37/64*

U.S. Cl. 493—195 **8 Claims**



1. A method of making a stand-up plastic bag, comprising the steps of:

(a) supplying a multi-layered film of first and second thermoplastic materials, said first material being heat-sealable at a temperature within a first temperature range and said second material being heat-sealable at a temperature within a second temperature range which is a range of temperatures higher than the temperatures in said first temperature range;

(b) folding said film to form a pair of front and rear side walls and a pair of front and rear bottom gusset walls disposed between said side walls with said first and second materials being on respective interior and exterior surfaces of said side and gusset walls;

(c) heat sealing at a temperature within said first temperature range to form a first set of heat seals which join lower portions of said front and rear bottom gusset walls with corresponding lower portions of said front and rear side walls at contiguous regions of said first material on said interior surfaces thereof and to form a bottom wall of connected upper portions of said front and rear bottom gusset walls which extend between said front and rear side walls, said first set of heat seals forming a support band which is connected to and extends below the periphery of said bottom wall;

(d) heat sealing at a temperature within said first temperature range to form a second set of heat seals which join said front and rear side walls with said front and rear bottom gusset walls along opposite longitudinal edges thereof at contiguous portions of said first material on interior surfaces of said longitudinal edges of said walls;

(e) heat sealing at a temperature within said second temperature range to form a third set of heat seals which join said front and rear bottom gusset walls together along their opposite longitudinal edges at contiguous portions of said second material on said exterior surfaces thereof and thereby complete formation of said support band as a continuous self-standing structure to define with said bottom wall a stand-up base on a bag; and

(f) separating said film into completed plastic bags by severing said film through at each of said heat seals at each of said longitudinal edges of said walls.

4,954,125

CATALYST FOR POLYMERIZATION OF CONJUGATED DIENE AND PROCESS FOR PRODUCING CONJUGATED DIENE POLYMER

Hisao Ono; Ryuji Sato, and Takumi Miyachi, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Company, Ltd., Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 208,664

Claims priority, application Japan, Jul. 20, 1987, 62-180605

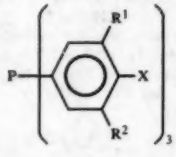
Int. Cl.[5] **C08F** *4/609, 36/06*

U.S. Cl. 526—138 **15 Claims**

1. A process for producing a conjugated diene polymer, which comprises polymerizing butadiene-1,3 in a hydrocarbon or halogenated hydrocarbon solvent in the presence of

(A) a cobalt compound selected from the group consisting of cobalt(II)-triphenylphosphine complex, cobalt(II) acetylacetonate, cobalt octenoate, cobalt naphthenate, cobalt(II) chloride, cobalt(II) bromide, cobalt(II) iodide, pyridine complexes of these cobalt halides and cobalt ethylxanthogenate,

(B) an organic phosphorous compound represented by the formula:



wherein R^1 and R^2 are independently hydrogen atoms, alkyl groups or aryl groups, provided that at least one of R^1 and R^2 is an alkyl group, and three X's, which may be the same or different, are independently selected from the group consisting of a methoxy group, an ethoxy group, a propoxy group, a butoxy group, a phenoxy group, a hydroxyl group, a dimethylamino group, a diethylamino group, a dipropylamino group, a dibutylamino group, a methylamino group, an ethylamino group and an amino group,

(C) an organoaluminum compound selected from the group consisting of triethylaluminum, tripropylaluminum, triisopropylaluminium, tributylaluminum, triisobutylaluminum, trihexylaluminum, triphenylaluminum, diethylaluminum monochloride, dipropylaluminum monochloride and diisobutylaluminum monochloride, and

(D) 0.25–1.5 mole, per mole of the organoaluminum compound (C), of water.

4,954,126

PROSTHESIS COMPRISING AN EXPANSIBLE OR CONTRACTILE TUBULAR BODY

Hans I. Wallstén, Denens, Switzerland, assignor to Shepherd Patents S.A., Switzerland

Continuation of Ser. No. 219,800, Jul. 15, 1988, abandoned, which is a continuation of Ser. No. 946,064, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 571,549, Dec. 7, 1983, abandoned. This application Mar. 28, 1989, Ser. No. 330,975

Claims priority, application Sweden, Apr. 30, 1982, 8202739; PCT Int'l Appl., Apr. 11, 1983, PCT/SE83/00131

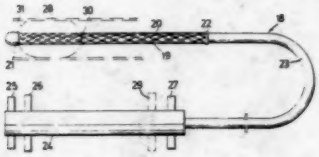
Int. Cl.[5] **A61F** *2/04, 2/06;* **A61M** *29/00*

U.S. Cl. 600—36 **6 Claims**

1. A method for forming and completely inserting a prosthesis in a body vessel, said prosthesis having a radially and axially flexible elastic tubular body with a diameter that is variable under axial movement of the ends of the body relative to each other and which is composed of a plurality of flexible and elastic thread elements, each of which extends in helix configuration along the center line of the body as a common axis, the

flexible and elastic elements defining a radially self-expanding body, said self-expanding body provided by a first number of elements having a common direction of winding but being axially displaced relative to each other and crossing a second number of elements also axially displaced relative to each other but having an opposite direction of winding, said method comprising the steps of:

(a) crossing the first and second elements such that an axially directed angle between the crossing elements is greater than 90°, the axially directed angle being defined by the



crossing of the first and second elements extending in the direction of the longitudinal axis of the cylinder;

(b) holding the prosthesis in a contracted state;

(c) inserting the prosthesis in its entirety into the body vessel at a first location;

(d) transferring the prosthesis in its entirety to a second location, remote from said first location, in the vessel; and

(e) allowing the prosthesis to expand within the vessel at said second location so as to fixedly implant said prosthesis at said second location.

4,954,127

PROCESS FOR PREPARING AN ARTIFICIAL VESSEL

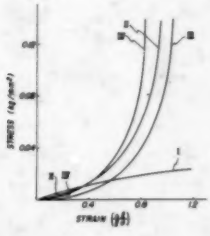
Kazuaki Kira, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 165,365, Feb. 29, 1988, Pat. No. 4,857,069, which is a continuation of Ser. No. 840,169, Mar. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 706,693, Feb. 28, 1985, abandoned. This application Jun. 26, 1989, Ser. No. 371,874

Claims priority, application Japan, Mar. 1, 1984, 59-39972; Mar. 7, 1984, 59-44396; Mar. 16, 1984, 59-51768; Mar. 19, 1984, 59-52674; Jan. 29, 1985, 60-14909; Feb. 9, 1985, 60-23983

Int. Cl.[5] **A61F** *2/06*

U.S. Cl. 600—36 **3 Claims**



1. A process for preparing an artificial vessel having a compliance and a stress-strain curve which are approximate to those of a vital vessel, said process comprising the steps of:

(1) coating a mandrel with an elastomer solution in which is dispersed a pore-forming agent;

(2) immersing the coated mandrel into a coagulating liquid for said elastomer;

(3) repeating steps (1) and (2) at least once;

(4) arranging a tubular element made of fibers on the mandrel or coated mandrel in at least one of steps (1) to (3); and

(5) removing the tubular article obtained after steps (1) to (4) from the mandrel and immersing the obtained tubular article in a liquid in which the pore-forming agent is soluble, so as to dissolve the pore-forming agent.

4,954,128

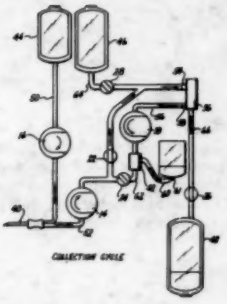
THERAPEUTICS PLASMA EXCHANGE SYSTEM

Michael G. Ford, Riverside, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Aug. 23, 1988, Ser. No. 235,056

Int. Cl.[5] **A61M** *1/38*

U.S. Cl. 604—5 **15 Claims**



1. A plasma exchange system for separating blood received from a donor into constituents and infusing the donor with a first blood constituent and a replacement fluid, comprising:

a separator for separating first and second blood constituents from whole blood;

a reservoir for containing the first blood constituent and having a single port;

a single venepuncture needle for supplying whole blood from the donor to said separator during a whole blood collection cycle and infusing the donor with the first blood constituent and a replacement fluid during an infusion cycle;

means for supplying the first blood constituent from said separator through said port to said reservoir during said collection cycle;

means including said single venepuncture needle in communication with said reservoir through said port for flowing the first blood constituent in said reservoir to the donor during the infusion cycle;

a fluid replacement supply source; and

means in communication with said fluid replacement supply source and said flow means for supplying replacement fluid to the donor during the infusion cycle;

wherein said means for flowing the first blood constituent to the donor and said means in communication with said fluid replacement supply source lie in communication one with the other for continuously mixing the first blood constituent and the replacement fluid one with the other for simultaneous combined return to the donor.

4,954,129

HYDRODYNAMIC CLOT FLUSHING

David Giuliani, Mercer Island, Wash., and Gerald G. Vurek, Mt. View, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

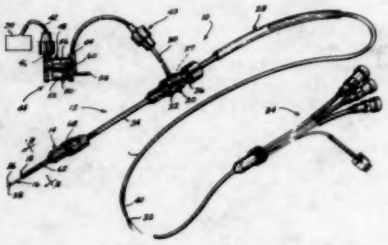
Filed Jul. 25, 1988, Ser. No. 224,074

Int. Cl.[5] **A61M** *5/00, 25/00*

U.S. Cl. 604—53 **17 Claims**

1. A process for flushing clots form an intravascular probe, comprising the steps of:

inserting a catheter assembly in a blood vessel, the catheter assembly comprising a catheter segment having an internal axial bore, the segment fitted substantially throughout its bore with an intravascular probe, wherein the intravascular probe does not completely occlude the internal axial bore;



delivering a flushant through the catheter bore and past the probe at a continual rate sufficient to maintain the catheter bore substantially free of blood clots; and

periodically delivering through the catheter bore a pulse of flushant at a rate that is higher than the continual rate and effective to substantially clear the probe of incipient blood clots.

4,954,130

CATHETER/HEPARIN LOCK AND METHOD OF USING SAME

John Edwards, Orange, Calif., assignor to William P. Waters, Balboa Island, Calif.

Continuation of Ser. No. 146,267, Jan. 20, 1988, abandoned. This application Apr. 17, 1989, Ser. No. 341,701

Int. Cl.[5] **A61M** *5/178*

U.S. Cl. 604—169 **5 Claims**

1. An intravenous access device comprising:

an elongated body having a hollow interior for the passage therethrough of fluid, said body having front and rear ends and having a hollow tip at the front end thereof for insertion into a vein;

an intravenous fluid port connected to said body intermediate its ends for connection in fluid communication with a supply line connected in fluid communication with a source of intravenous fluid under pressure for delivering said fluid to the interior of said body for administration to a patient;

means disposed at said port for connecting sealably and removably the end of said line to said port;

a hollow tubular member disposed coaxially within said body located at the rear end thereof, said hollow member having a front and a rear opening;

a membrane closing said rear opening resealably for admitting injectable fluids therethrough;

means defining an aperture in the side of said member for being positioned in alignment with said port to permit said intravenous fluid to flow into the hollow interior of said body and for being positioned out of alignment with said port for fluid blocking purposes; and

means for mounting said member movably coaxially within said body for movement into and out of alignment with said intravenous fluid port to control fluid flow therethrough, so that said port can be closed and the supply line removed from said port, to permit said device to remain indwelling a vein and permitting introduction of injectable fluids through said membrane and the withdrawal of blood therethrough.

4,954,131

SUBSTITUTED METAAMINOPHENOLS, A PROCESS FOR THEIR PREPARATION, HAIR-DYEING COMPOSITIONS CONTAINING THEM AND A HAIR-DYEING PROCESS

Andrée Bugaut, Boulogne, and Alex Junino, Aulnay, both of France, assignors to L'Oreal, Paris, France

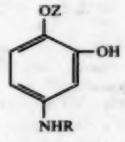
Division of Ser. No. 618,149, Jun. 7, 1984, Pat. No. 4,863,480. This application Jul. 26, 1989, Ser. No. 385,496

Claims priority, application France, Jun. 13, 1983, 83 09734

Int. Cl.[5] A61K *7/13;* **C07C** *91/40, 91/42*

U.S. Cl. 8—421 **20 Claims**

1. A metaaminophenol having the formula:



(I)

wherein

Z represents a monohydroxylated or polyhydroxylated hydrocarbon radical having 1–6 carbon atoms, and

R represents a monocarbamyl alkyl, dicarbamylalkyl, aminoalkyl, acyl, carbalkoxyalkyl, carbamyl or monoalkylcarbamyl, wherein the alkyl moieties contain 1–6 carbon atoms,

or an acid salt thereof.

4,954,132

TINTED CONTACT LENS AND METHOD OF TINTING WITH REACTIVE DYE AND QUATERNARY AMMONIUM SALT

William M. Hung, and Kai C. Su, both of Alpharetta, Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 14, 1989, Ser. No. 323,355

Int. Cl.[5] D06P *5/00*

U.S. Cl. 8—507 **10 Claims**

1. An improvement in a process for preparing a soft contact lens tinted over at least a portion of its surface having the steps of forming on aqueous tinting solution comprising a reactive dyestuff and applying said tinting solution to a polymeric hydrogel contact lens material, wherein the improvement comprises adding an effective amount of an ammonium quaternary salt to said tinting solution before said applying step.

4,954,133

MIXTURES OF A 1:1 COPPER OR NICKEL COMPLEX OF A STILBENE-AZO OR STILBENE-AZOXY COMPOUND HAVING TWO 4,4'-(2,2'-DISULFOSTILBENYLENE) RADICALS AND A 1:1 COPPER OR NICKEL COMPLEX OF A STILBENE-AZO OR STILBENE-AZOXY COMPOUND HAVING ONE SUCH RADICAL

Max Oppliger, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

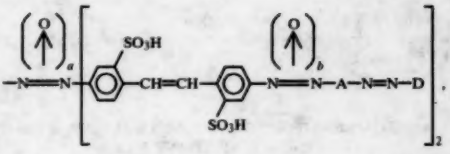
Continuation of Ser. No. 705,744, Feb. 26, 1985, abandoned, which is a continuation of Ser. No. 455,140, Jan. 3, 1983, abandoned. This application Feb. 12, 1986, Ser. No. 828,934

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1981, 3151978

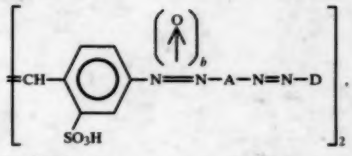
Int. Cl.[5] C09B *67/22, 67/24, 45/28;* **C07C** *238/08*

U.S. Cl. 8—681 **10 Claims**

1. A mixture consisting essentially of (a) a 1:1 copper complex of a compound of the formula



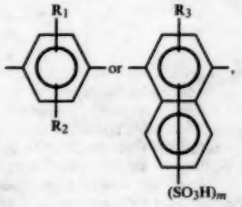
or a salt thereof each cation of which is independently a non-chromophoric cation, and (b) a 1:1 copper complex of a compound of the formula



or a salt thereof each cation of which is independently a non-chromophoric cation,

wherein

each A is independently



wherein

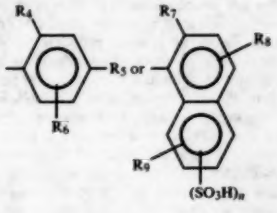
R_1 is hydrogen, halo, C_{1-4}alkyl or C_{1-4}alkoxy,

R_2 is hydrogen, halo, C_{1-4}alkyl, C_{1-4}alkoxy, ureido or (C_{1-4}alkyl)carbonylamino,

R_3 is hydrogen or methoxy, and

m is 0, 1 or 2,

each D is independently



wherein

R_4 is hydrogen, hydroxy or methoxy,

R_5 is hydrogen, hydroxy, C_{1-4}alkyl, C_{2-4}hydroxyalkyl, C_{1-4}alkoxy, C_{2-4}hydroxyalkoxy or $-N(R_{14})_2$,

wherein each R_{14} is independently hydrogen, C_{1-4}alkyl or C_{2-4}alkyl substituted by 1 or 2 substituents each of which is independently hydroxy, cyano, halo or C_{1-4}alkoxy,

R_6 is hydrogen, C_{1-4}alkyl, C_{2-4}hydroxyalkyl, C_{1-4}alkoxy, (C_{1-4}alkyl)carbonylamino, carboxy or sulfo,

R_7 is hydrogen, hydroxy or methoxy,

R_8 is hydrogen, carboxy or sulfo,

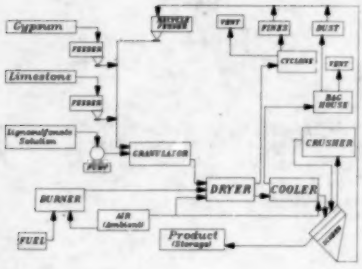
R_9 is hydrogen or hydroxy, and
n is 0, 1 or 2, and
a and each b is independently 0 or 1,
wherein the ratio of component (a) to component (b) is 2½:1 to 1:1.5 by weight.

4,954,134

AGGLOMERATION OF GYPSUM, LIMESTONE, OR GYPSUM-LIMESTONE MIX

Cecil P. Harrison, Florence, and Cullen G. Tittle, Tuscumbia, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Jul. 31, 1989, Ser. No. 386,914
Int. Cl.[5] C05G *5/00*; C05D *3/02*; B01J *2/00*
U.S. Cl. 23—313 R **14 Claims**



1. A process for making a granular fertilizer product for use as a source of calcium secondary plant nutrient, to produce agglomerated granules of sufficient strength, proper size, and adequate weight to be suitable for mechanical dispensing and application to and into the soil, from fine particles of a calcium source that is characterized by poor solubility in water and by slow conversion in the soil to a form in which it is useful to plant life growing in the soil, said calcium source being selected from a mixture of fine particles of limestone and fine particles of gypsum, said particles of limestone having an individual particle-size distribution of about 15 to 25 percent plus 20 mesh, about 10 to 25 percent minus 20 plus 40 mesh, about 15 to 30 percent minus 40 plus 100 mesh, about 10 to 25 percent minus 100 plus 325 mesh, and about 15 to 25 percent minus 325 mesh, U.S. Standard Testing Sieve, said particles of gypsum having an individual particle-size distribution of about 0.1 to about 2 percent minus 20 plus 40 mesh, about 10 to 20 percent minus 40 plus 100 mesh, about 30 to 50 percent minus 100 plus 325 mesh, and about 30 to 50 percent minus 325 mesh, U.S. Standard Testing Sieve, the relative proportions of said gypsum and said limestone being from about 80 parts to about 95 parts by weight of said gypsum and from about 20 parts to about 5 parts by weight of said limestone, said gypsum selected from the group consisting of sulfogypsum, mineral gypsum, and mixtures thereof, said particles being present in an amount to comprise from about 90 percent to about 96 percent by weight of said granules, dry basis, and comprising:

applying to said particles a small but effective amount of a binder so as to bind said fine particles together in the form of granular agglomerates, said binder after distribution of the granules in the soil being capable of permitting the utilization of the secondary plant nutrient calcium values of said particles;

drying and screening the agglomerated granules to produce granular agglomerated product having sizes in the range from between about 60 percent to about 90 percent minus 6 plus 16 mesh, Tyler Standard Screen Scale;

said binder being selected from the group consisting of a water-soluble metal or ammonium salt of lignosulfonic acid and mixtures thereof, and applied so that the average crushing strength of a sample of said granules, selected to have a size range of minus 7 plus 8 tyler Standard Screen Scale, is at least about three pounds per granule.

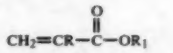
4,954,135

OIL COMPOSITIONS CONTAINING TERPOLYMERS OF ALKYL ACRYLATES OR METHACRYLATES, AN OLEFINICALLY UNSATURATED HOMO OR HETEROCYCLIC-NITROGEN COMPOUND AND ALLYL ACRYLATES OR METHACRYLATES

Hanh T. Le, Wilmington, Del., assignor to Conco Inc., Ponca City, Okla.

Continuation of Ser. No. 265,626, Oct. 31, 1988, Pat. No. 4,886,520. This application Aug. 11, 1989, Ser. No. 392,758
Int. Cl.[5] C10L *1/18, 1/22*
U.S. Cl. 44—62 **19 Claims**

1. An oil composition which comprises a major amount of an oil selected from a crude oil and a minor amount of (1) an alkyl ester of unsaturated monocarboxylic acid, (2) an olefinically unsaturated homo or heterocyclic-nitrogen compound and (3) allyl acrylate or methacrylate terpolymer having pour point depressant properties, said terpolymer comprising the reaction product of (a) a monomeric alkyl ester of carboxylic acid or a mixture of alkyl esters of carboxylic acid having the formula:



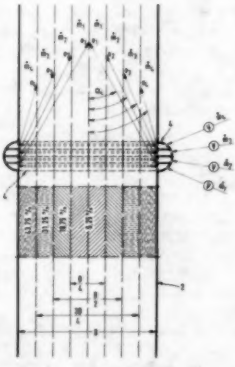
wherein R is H or CH_3 and R_1 is alkyl having from about 1 to about 30 carbon atoms; (b) vinyl pyridine; and (c) allyl acrylate or methacrylate.

4,954,136

METHOD OF COOLING HOT PRODUCT GAS WITH ADHESIVE OR FUSIBLE PARTICLES

Friedrich Jokisch, Mühlheim/Ruhr; Adolf Linke, Essen, and Hans-Christoph Pohl, Witten, all of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed May 3, 1989, Ser. No. 347,333
Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816340
Int. Cl.[5] C10J *3/46, 3/84*
U.S. Cl. 48—197 R **8 Claims**



1. A method of cooling a hot product gas containing adhesive or fusible particles which lose their adhesiveness during cooling, comprising the steps of injecting into a hot product gas in a cooling zone with a circular cross-section in a flow direction of the gas a plurality of separate individual cooling

fluid jets which together form a total ring-shaped cooling fluid jet and said separate jets being supplied with cooling medium via a plurality of plenums and controls to have different masses and different penetration depths correspond to different amounts of product gas stream flowing in individual ring-shaped parts of the cooling zone; and selecting the injection speeds of the individual cooling fluid jets so that desired penetration depths are obtained.

4,954,137

INHIBITION OF SULFIDE INCLUSION IN SLAG

Michael W. Potter, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 19, 1989, Ser. No. 452,438
Int. Cl.[5] C10J *3/00, 3/46*
U.S. Cl. 48—210 **6 Claims**

1. A process for the gasification of coal comprising partially combusting particulate coal in a gasification reactor comprising a gasification zone and a water bath and producing a hot gaseous stream containing synthesis gas and flyash, and slag in the gasification zone, and allowing the slag produced to discharge from the reaction zone into the water bath, the redox potential of the water bath being maintained at level sufficient to inhibit sulfide presence or inclusion in the slag.

4,954,138

STONE TO FINISH STONE WASHED JEANS

Kenneth R. Butcher, Hendersonville, N.C.; Carmine M. Doddato, Cuyahoga Falls, and Donna M. Stough, Kent, both of Ohio, assignors to Norton Company, Worcester, Mass.

Filed Nov. 7, 1988, Ser. No. 268,097
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **6 Claims**

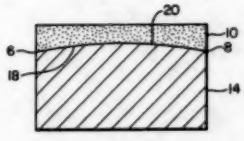
1. A manufactured abrasive, water-insoluble fabric finishing stone which is prepared from a combination of particulates comprised of at least one filler material, at least one bonding agent, and optionally at least one abrasive material; wherein at least either the filler material or the bonding agent is inorganic, the finishing stone has a packing density of less than about 50 pounds per cubic foot, and loses less than about 15 percent of its weight in an abrasion test wherein about 2.5 pounds of said stones are placed in a 8.5 inch diameter by 7.25 inch long cylinder having a ribbed rubber lining and the cylinder is tumbled at 60 rpm for 1 hour wherein the filler material is selected from the group consisting of perlite and vermiculite.

4,954,139

METHOD FOR PRODUCING POLYCRYSTALLINE COMPACT TOOL BLANKS WITH FLAT CARBIDE SUPPORT/DIAMOND OR CBN INTERFACES

David B. Cerutti, Worthington, Ohio, assignor to The General Electric Company, Worthington, Ohio

Filed Mar. 31, 1989, Ser. No. 331,928
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **23 Claims**



1. In a method for making a supported polycrystalline diamond (PCD) or cubic boron nitride (CBN) compact comprising:

placing in an enclosure a cup assembly having a mass of diamond or CBN particles having a surface, a mass of cemented metal carbide having a surface, and for diamond particles optionally a catalyst for diamond recrystallization, said surfaces being in adjacency for forming an interface;

subjecting said enclosure to a HP/HT process which results in a compact bonded to a cemented carbide support at said interface;

recovering said supported compact from said enclosure and said cup assembly; and

finishing said supported compact, said finished supported compact, exhibiting a non-planar interface resulting in a PCD or CBN compact of substantially non-uniform thickness,

the improvement which comprises said carbide mass surface placed in said assembly being the mirror image of said finished PCD or CBN non-planar interface for making a finished supported compact of substantially uniform compact thickness.

4,954,140

ABRASIVES, ABRASIVE TOOLS, AND GRINDING METHOD

Norimichi Kawashima, and Kazuya Orii, both of Tokyo, Japan, assignors to Tokyo Magnetic Printing Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,519
Claims priority, application Japan, Feb. 9, 1988, 63-26607
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—295 **14 Claims**

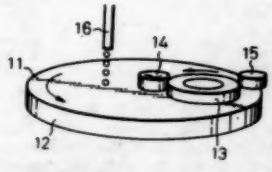
1. A composite spherical-particle abrasive comprising spherical particles of a solid polymer having an average diameter of less than about 20 μm and abrasive particles having an average diameter of 0.01 to about 5 μm but less than the average diameter of said spherical particles, each of said spherical particle being coated with said abrasive particles.

4,954,141

POLISHING PAD FOR SEMICONDUCTOR WAFERS

Masahiro Takiyama; Kunihiro Miyazaki, both of Shiojiri, and Kenichiro Shiozawa, Ashiya, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo and Chiyoda Kaushiki Kaisha, Osaka, both of, Japan

Filed Jan. 25, 1989, Ser. No. 301,283
Claims priority, application Japan, Jan. 28, 1988, 63-15876
Int. Cl.[5] B24D *3/32;* H01L *21/306*
U.S. Cl. 51—296 **6 Claims**



1. A polishing pad for obtaining a mirror-like surface of a semiconductor wafer, said pad comprising a sheet of foamed fluorine-containing resin, wherein said pad of said foamed fluorine-containing resin has an average pore size of 10 to 2000 μm and porosity of 60 to 95%.

4,954,142

METHOD OF CHEMICAL-MECHANICAL POLISHING AN ELECTRONIC COMPONENT SUBSTRATE AND POLISHING SLURRY THEREFOR

Jeffrey W. Carr, Fishkill; Lawrence D. David, Wappingers Falls; William L. Guthrie, Hopewell Junction; Frank B. Kaufman, Amawalk; William J. Patrick, Newburgh; Kenneth P. Rodbell, Poughkeepsie; Robert W. Pasco, Wappingers Falls, and Anton Nenadic, Red Hook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1989, Ser. No. 285,435

Int. Cl.[5] C09C *1/68*

U.S. Cl. 51—309 24 Claims

1. A chem-mech polishing slurry comprising:
abrasive particles;
a transition metal chelated salt; and
a solvent for said salt.

4,954,143

GAS SEPARATION

Graham W. Scott, Northwich; Paul Gough, Runcorn; Brian N. Hendy, and Michael B. Cinderey, both of Middlesbrough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 148,099, Jan. 26, 1988, abandoned, which is a continuation of Ser. No. 865,023, May 20, 1986, abandoned. This application Jul. 24, 1989, Ser. No. 384,059

Claims priority, application United Kingdom, May 21, 1985, 8512764

Int. Cl.[5] B01D *53/22, 71/68*

U.S. Cl. 55—16 24 Claims

1. A gas separation process in which a gas feed mixture of two or more gases is contacted with a surface of a gas separation membrane and a gas, or a gas mixture having a different composition from that of the gas feed mixture, is removed from the vicinity of an opposite surface of the membrane, wherein the gas separation membrane is formed from a polyarylsulphone, where said polyarylsulphone carry groups SO_3M, where M is a hydrogen atom, a metal atom and/or a group NR_4, and wherein the groups M may be the same or different and the proportion of groups M is sufficient to combine with the unsatisfied valencies of the group $—SO_3$; where R is a hydrogen atom or an alkyl group, and where said polyarylsulphone comprises 10 mol % to 100 mol % of a polymer containing repeated units of the formula D:

$$-(-Ph^2—O—Ph^3—O—Ph^2—SO_2-)- \quad (D)$$

wherein,
Ph^2 represents phenylene residue, and
Ph^3 represents phenylene residue having one or two of said groups SO_3M.

4,954,144

POLYIMIDE MEMBRANES AND THEIR USE FOR GAS SEPARATION

William F. Burgoyne, Jr., Emmaus; Michael Langsam, Allentown, both of Pa., and Robert L. Fowlkes, Milton, Fla., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 12, 1989, Ser. No. 406,225

Int. Cl.[5] B01D *53/22, 71/64*

U.S. Cl. 55—16 6 Claims

1. A process for separating a component of a gas mixture containing at least one other component, said process comprising bringing said gas mixture into contact with a membrane formed of a polyimide having repeating units formed from a dianhydride and 2,5-di-t-butyl-1,4-phenylene diamine, such that one component of said gas mixture selectively permeates said membrane.

4,954,145

FILLED MEMBRANES FOR SEPARATION OF POLAR FROM NON-POLAR GASES

Yatin B. Thakore, East Brunswick, and Vladimir Stoy, Princeton, both of N.J., assignors to Kingston Technologies, Dayton, N.J.

Continuation-in-part of Ser. No. 926,447, Nov. 3, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 155,986

Int. Cl.[5] B01D *53/22, 61/38*

U.S. Cl. 55—16 21 Claims

1. The process which comprises passing a mixture of gases across a first side of a gas permeable, filled pore membrane at a pressure higher than that which obtains on the second side of said membrane, said membrane comprising:
(a) a porous membrane, the pores of which have a size of from about 5 angstroms to about 10 microns, and
(b) a substantially non-aqueous composition filling said pores, said composition comprising:
(i) a polar organic solvent of low volatility and having a boiling point of at least about 150° C., said solvent consisting of at least one member selected from the group consisting of an alkane polyglycol of 2 to 6 carbon atoms and a poly(alkyleneoxy) of an alkane glycol of 2 to 4 carbon atoms having a molecular weight up to 600; and
(ii) at least one gas carrier component selected from the group consisting of alkali metal salts of weak acids having a pK at 25° C. exceeding 2.0, amines, and (hydroxy lower alkyl)amines, said amines and (hydroxy lower alkyl)amines having low volatility and a boiling point of at least about 150° C.,
whereby gases in said mixture which react with said gas carrier component diffuse preferentially to said second side of said membrane.

4,954,146

SEPARATION OF GASEOUS MIXTURES

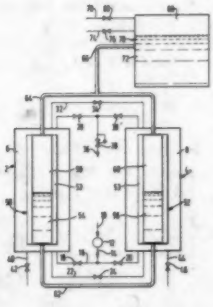
Michael E. Garrett, Woking, United Kingdom, and William R. Weltmer, Jr., Murray Hill, N.J., assignors to The BOC Group plc, Windlesham, England

Filed Apr. 20, 1989, Ser. No. 340,964

Claims priority, application United Kingdom, May 24, 1988, 8812263

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—25 11 Claims



1. A method of separating a gaseous mixture by pressure swing adsorption utilizing at least two beds of adsorbent material capable of adsorbing at least one component of said mixture comprising:

(a) admitting the mixture to a bed of adsorbent material under pressure, thereby adsorbing said component and discharging a gas relatively lean with regard thereto, and

(b) desorbing said adsorbed component from said bed by subjecting the bed to a pressure lower than that at which adsorption is performed and discharging said component,

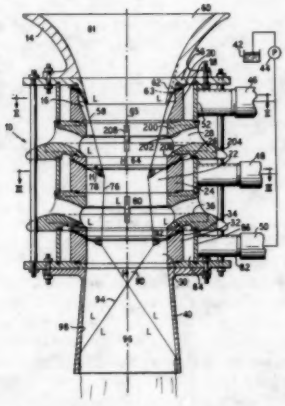
wherein said method is carried out in a cyclic manner with the beds out of phase such that, in each cycle, a portion of the time in which each of said beds is undergoing adsorption, another is undergoing desorption, the method further including transferring heat generated in said bed undergoing adsorption by causing vapor to be evolved from a volatile liquid contained in a heat exchange chamber within said adsorbing bed and causing said vapor to be condensed in a heat exchange chamber in said desorbing bed, the upper and lower portions, respectively, of said heat exchange chambers being in fluid flow communication, such that there is a net flow of vapor from the chamber in the adsorbing bed to the chamber in the desorbing bed and a net flow of liquid from the chamber in the desorbing bed to the chamber in the adsorbing bed.

4,954,147

WATER CONDITIONING APPARATUS AND METHOD

Randy A. Galgon, Nuremberg, Pa., assignor to Hazleton Environmental Products, Inc., Hazleton, Pa.

Filed Jun. 15, 1989, Ser. No. 366,641
Int. Cl.[5] B01D *17/038*
U.S. Cl. 55—53 **13 Claims**



1. An apparatus for treating water comprising:

an axially aligned series of stripping chambers;

said stripping chambers comprising inlets for introducing raw water to be treated into said chambers;

an atmospheric air inlet interposed between adjacent stripping chambers and at one end of said series of chambers; and

an outlet connected at an opposite end of said series of chambers.

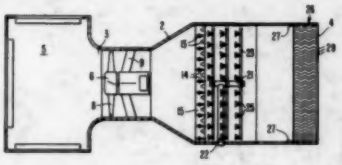
4,954,148

APPARATUS FOR TREATING GAS

Jack L. Alexander, Sr., Danville, Va., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 111,637, Oct. 23, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 270,453
Int. Cl.[5] B01D *47/12*
U.S. Cl. 55—223 **12 Claims**

1. In an apparatus for treating a gas stream with a liquid, the combination of a housing having side walls and an inlet and an outlet for the gas stream, means for moving the gas stream at a high velocity through the housing generally horizontally from the inlet to the outlet, means for placing substantial quantities of liquid into intimate contact with the gas stream to condition the gas stream, and an eliminator for removing liquid particles from the gas stream, the improvement comprising means in the housing upstream of the eliminator for removing from the gas



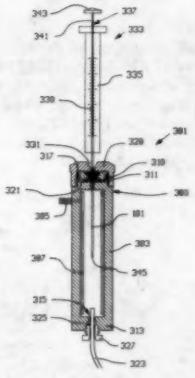
stream large quantities of the liquid which travel along the side walls of the housing, said liquid removing means comprising substantially vertical elements projecting from the side walls of the housing toward the center of the gas stream, said vertical elements being positioned upstream of and adjacent to the eliminator.

4,954,149

INJECTION SEPTUM

James S. Fullemann, Half Moon Bay, Calif., assignor to Merlin Instrument Company, Half Moon Bay, Calif.

Filed Oct. 25, 1989, Ser. No. 427,033
Int. Cl.[5] B01D *15/08*
U.S. Cl. 55—386 **10 Claims**



1. A septum for permitting injection of a fluid by extension of a needle therethrough, said needle having an injection diameter, said septum comprising:

aperture means for defining a complex aperture, said complex aperture including an annular aperture with a minimum diameter and a duckbill aperture with a duckbill perimeter, said aperture means including elastic material bounding said complex aperture, said minimum diameter being less than said injection diameter when no needle is penetrating therethrough, said minimum diameter being substantially equal to said injection diameter when said needle penetrates said annular aperture, said perimeter being at least as great as said injection diameter when said needle penetrates through said duckbill aperture, said elastic material contacting and generally conforming to the cross section of said needle at said annular aperture and said duckbill aperture when said needle extends completely through said complex aperture.

4,954,150

DEVICE FOR BRANCHING GAS FLOWS

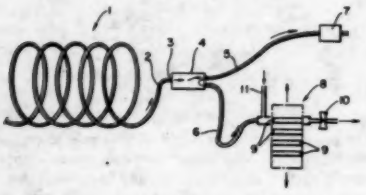
Franz Etzweiler, Greifensee, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Oct. 7, 1988, Ser. No. 254,990

Claims priority, application Switzerland, Oct. 8, 1987, 3948/87

Int. Cl.[5] B01D *15/08*

U.S. Cl. 55—386 2 Claims



1. A device for branching gas flows, more particularly in a gas chromatograph, the device having an inlet branch connected to the output of a separating column; two outlet branches which extend from a junction to subsequent parts of the plant, characterized in that a first outlet branch (6) is connected by way of a shutoff valve (10) to means producing a pressure lower than the pressure in the other outlet branch (5); an interceptor in the first outlet branch (6) between the junction and the valve (10); and a scavenging gas feed (11) between the junction and the interceptor extending into the first outlet branch (6).

4,954,151

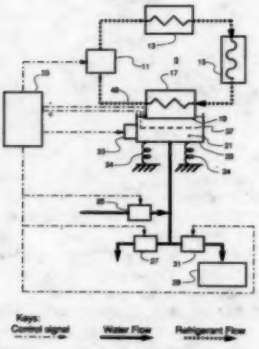
METHOD AND MEANS FOR OPTIMIZING BATCH CRYSTALLIZATION FOR PURIFYING WATER

Chung-Nan Chang, Los Altos; William M. Conlon, Palo Alto, and Donald M. Hendricks, Moraga, all of Calif., assignors to Polar Spring Corporation, Menlo Park, Calif.

Filed Jan. 10, 1989, Ser. No. 295,651

Int. Cl.[5] B01D *9/04*

U.S. Cl. 62—532 51 Claims



1. Apparatus for removing impurities from impure water comprising:

a chamber for confining a volume of water to be purified;

heat transfer means including a freeze plate disposed to contact the surface of water within the chamber to extract heat therefrom substantially only from upper regions thereof to form a layer of ice in a volume of water adjacent the upper region of the chamber;

circuit means disposed within the chamber to establish an electric field relative to the freeze plate for exerting electrostatic force upon impurities in water within the chamber in a direction away from the freeze plate;

heater means disposed to melt ice within the chamber; and

means connected to the chamber for removing water therefrom associated with melting ice therein.

4,954,152

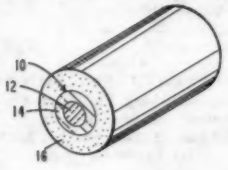
HIGH STRENGTH OPTICAL FIBER SPLICE

Hui-Pin Hsu, Northridge, and Soon Jang, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1988, Ser. No. 286,447

Int. Cl.[5] C03C *25/02;* C03B *23/207, 6/255*

U.S. Cl. 65—3.1 13 Claims



1. A method for splicing together two optical glass fibers to form a single spliced optical glass fiber, comprising the steps of:

cleaving each of the glass fibers to form a splicing face on each fiber, the orientations of the splicing faces being in a linear opposing fashion;

precleaning the splicing face and adjacent region of each fiber to remove impurities present on the splicing face and adjacent lateral surface of the fiber, and removing any precleaning residue;

aligning the two fibers in a linear opposing fashion with the cleaved faces in a facing relationship to each other, the linear opposing relation being determined by maximizing the light transmitted through the fibers;

fusing the two fibers by use of a laser and by the steps of

preheating the fiber ends to a temperature below the melting point of the glass for a time sufficient to remove impurities and dust on the fiber surfaces and ends,

heating the fiber ends to a temperature above the melting point of the glass and simultaneously forcing the fiber ends together to fuse the two fibers into a single length of spliced fiber, and

annealing the single length of fiber adjacent to the splice at a temperature below the melting point of the glass for a time sufficient to remove residual stresses, said preheating, heating and annealing steps being accomplished by changing the focus of said laser; and

postcleaning the spliced fiber to remove silica particles and other contaminants remaining on the surface after the step of fusing, and removing any postcleaning residue.

4,954,153

PROCESSING GLASS SHEETS WITH CERAMIC ENAMEL BANDS

Charles R. Coleman, Pittsburgh; Terry L. Wolfe, Allison Park; John A. Winter, and Elizabeth A. Fiano, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 3, 1989, Ser. No. 374,910

Int. Cl.[5] C03C *3/00, 17/04;* C03B *23/02*

U.S. Cl. 65—60.53 13 Claims

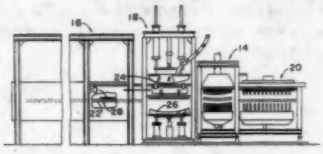
1. A method of processing a glass substrate having a ceramic enamel material supported on the glass substrate, the glass

substrate having a predetermined softening temperature, comprising:

applying a ceramic enamel material having a predetermined firing temperature to selected portions of a glass substrate, wherein said firing temperature is greater than said softening temperature of said substrate;

preheating said glass substrate and material to a temperature at or below said softening temperature;

exposing said selected portions of said glass substrate and said material to thermal radiation of predetermined wavelengths, wherein said material is preferentially absorbed by and more responsive to said thermal radiation than said substrate, for a period of time sufficient to increase the temperature of said material to said firing temperature while maintaining the temperature of said selected portions of said glass substrate at or below said softening temperature;



controllably cooling said material to about the same temperature as said preheated glass substrate; and

shaping said glass substrate.

4,954,154

CONTROLLED RELEASE FERTILIZER GEL COMPOSITION AND PROCESS FOR ITS PRODUCTION

Harvey M. Goertz, Marysville, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio

Continuation of Ser. No. 844,095, Mar. 26, 1986, abandoned. This application Dec. 27, 1988, Ser. No. 290,857

Int. Cl.[5] C05G 3/02; C05C 9/00

U.S. Cl. 71—3 **24 Claims**

1. A gel composition comprising:

a gel structure formed by subjecting a liquid medium containing particulate methylene urea polymers in the absence of added thickener - suspending agents to a shearing action, said shearing action comprising the application of force to the particles in said liquid medium,

said methylene urea polymers in said liquid medium including methylene diurea particles in an amount greater than the solubility limit of methylene diurea in the liquid medium and in an amount sufficient, upon subjecting said methylene diurea particles in said liquid medium to said shearing action, to provide a gel structure for suspending insoluble particles therein,

and said methylene diurea particles being subjected to sufficient force by said shearing action to cause a reduction of the size of the methylene diurea particles to molecular size whereby the methylene diurea enters into solution and subsequently recrystallizes from said liquid medium substantially in crystalline form to form said gel structure with said liquid medium.

4,954,155

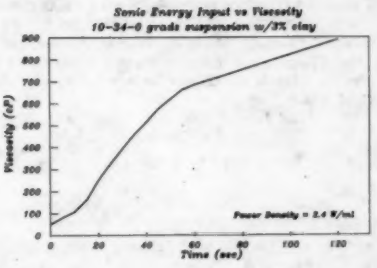
SONIC GELLING OF CLAY IN SUSPENSION FERTILIZERS

Jimmie L. Elrod, and Robert G. Lee, both of Killen, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Apr. 6, 1988, Ser. No. 178,726

Int. Cl.[5] C05C 9/00; C05G 3/00

U.S. Cl. 71—28 **4 Claims**



1. In an improved process for effecting production of suspension fertilizer product, said suspension fertilizer product having high plant food contents, high available N or P_2O_5 or both, excellent flow properties, relatively low initial viscosities of greater than about 250 centipoises, and excellent long term storage properties including post storage viscosities of less than about 1,000 centipoises, comprising the steps of:

(a) introducing a stream of fluid fertilizer material into reactor means, said fluid fertilizer material comprising from about 96 percent to about 99 percent by weight of the materials introduced thereinto;

(b) introducing a stream of gelling channelized 2:1 clay material into said reactor means, said gelling channelized 2:1 clay material ranging from about 1 percent to about 4 percent by weight of the material introduced thereinto;

(c) subjecting the mixture of said fluid fertilizer material and said clay material resulting from the introduction of streams thereof into said reactor means to agitation to effect a resulting suspension fertilizer therein; and

(d) removing at least a portion of the resulting suspension fertilizer from said reactor means as product;

the improvement in combination therewith for more efficiently imparting energy to the particles of clay material so as to cause said particles to be physically broken and deagglomerated into their component individual needlelike crystals thereby effecting the formation of a gel characterized by its capability to both cause an increase in the viscosity of the resulting suspension and to minimize the settling of particles therein during storage, said particles ranging upwards to about 20 mesh in size, which improvement in combination therewith comprises the additional step of:

(1) providing agitation in step (c) supra for a period of time ranging from about 0.25 to about 10 minutes by operatively connecting ultrasonic energy output transducer means with said mixture, said transducer means operating

at a frequency ranging from about 10 to about 40 kilohertz and at an energy output level sufficient to impart to said mixture an average power density ranging from about 1 to about 5 W/ml;

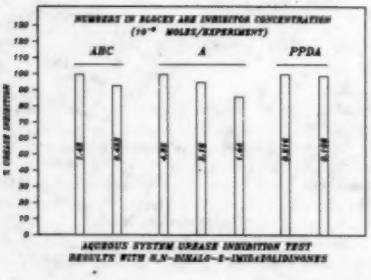
said improved process characterized by the fact that the total energy, per unit of product produced, necessary to supply said ultrasonic induced agitation in step (1) supra ranges from about 5 to about 100 percent of that which would otherwise be required to provide agitation through the utilization of conventional mechanical means for imparting shear energy thereto.

4,954,156

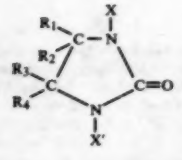
N,N-DIHALO-2-IMIDAZOLIDINONES AND N-HALO-2-OXAZOLIDINONES AS UREASE AND NITRIFICATION INHIBITORS

Joe Gautney, Sheffield; Shelby D. Worley, Auburn, and Doris H. Ash, Florence, all of Ala., assignors to Tennessee Valley Authority, Muscle Shoals and Auburn University, Auburn, both of, Ala.

Filed Jan. 17, 1989, Ser. No. 297,165
Int. Cl.[5] C05G *3/08*
U.S. Cl. 71—28 **32 Claims**



1. A method for controlling enzymatic decomposition of urea juxtaposed soil systems or in vivo solution systems, said enzymatic decomposition of said urea being to ammonia and carbonic acid and being due to the action of the enzyme urease thereupon, said method consisting essentially of exposing said enzyme to relatively small predetermined amounts of at least one N,N'-dihalo-2-imidazolidinone of the formula



wherein X and X' are halogens selected from the group consisting of chlorine, bromine, and mixtures thereof; wherein R1, R2, R3, and R4 are selected from the group consisting of hydrogen, C1-C4 alkyl, C1-C4 alkoxy, hydroxy, substituted phenyl, and mixtures thereof; and wherein not more than one of the substituents R1-R4 is hydrogen.

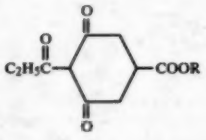
4,954,157

PLANT GROWTH REGULATING COMPOSITION AND METHOD FOR REGULATING GROWTH OF A PLANT

Takeshige Miyazawa, Shizuoka, and Kazuhiko Kawano, Niiza, both of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,550
Claims priority, application Japan, May 19, 1988, 63-122268
Int. Cl.[5] A01N *31/06, 57/12, 57/20*
U.S. Cl. 71—86 **4 Claims**

1. A plant growth regulating composition comprising a member selected from the group consisting of 3,5-dioxo-4-propionylcyclohexane carboxylic acid and its esters and salts, represented by the formula:



(I)

wherein R is a hydrogen atom, a lower alkyl group or a cation, and (2-chloroethyl) phosphonic acid, as active ingredients, in a ratio of 1:0.2–20 by weight and an agricultural carrier or diluent.

4,954,158

2,3-METHANOPROLINE

Charles H. Stammer, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 41,642, Apr. 22, 1987, which is a continuation of Ser. No. 879,842, Jun. 26, 1986, which is a continuation of Ser. No. 636,091, Aug. 3, 1984, which is a continuation-in-part of Ser. No. 523,080, Aug. 16, 1983. This application Dec. 15, 1988, Ser. No. 285,542
Int. Cl.[5] A01N *43/38*; C07D *209/52*
U.S. Cl. 71—76 **7 Claims**

1. A compound of the general structure

wherein:

R_1 is H, R_9, COR_3, CO_2R_3, SO_2R_3, or $R_3CH(NH_2)CO$—;

R_2 is H, R_9, OR_3, OH, Cl, Br, F, I, NH_2, NHR_3, $N(R_3)_2$, benzyl, phenyl, or substituted benzyl or phenyl wherein the substituents are selected from the group consisting of F, Cl, Br, I, R_9, OR_9, NHR_9, $N(R_9)_2$, SR_9, SO_2R_9, COR_9, or CO_2R_9;

R_3 is H, R_9, phenyl or substituted phenyl wherein the substituents are selected from the group consisting of F, Cl, Br, I, R_9, OR_9, NHR_9, $N(R_9)_2$, SR_9, SO_2R_9, COR_9, CO_2R_9;

R_4 is H, Cl, Br, I, F, OR_8 or OH;

R_5 is R_3 or =O;

R_6 and R_7 are R_3 or COR_3;

R_8 is R_3, R_3CO, or R_3SO_2; and

R_9 is a straight, branched, or cyclic alkyl group of from C_1 to C_{12}.

7. A method of inhibiting ethylene production in plant material comprising administering in a botanically acceptable carrier the compound of the general structure

wherein:

R_1 is H, R_9, COR_3, CO_2R_3, SO_2R_3, or $R_3CH(NH_2)CO$—;

R_2 is H, R_9, OR_3, OH, Cl, Br, F, I, NH_2, NHR_3, $N(R_3)_2$, benzyl, phenyl, or substituted benzyl or phenyl wherein the substituents are selected from the group consisting of F, Cl, Br, I, R_9, OR_9, NHR_9, $N(R_9)_2$, SR_9, SO_2R_9, COR_9, or CO_2R_9;

R_3 is H, R_9, phenyl or substituted phenyl wherein the substituents are selected from the group consisting of F, Cl, Br, I, R_9, OR_9, NHR_9, $N(R_9)_2$, SR_9, SO_2R_9, COR_9, CO_2R_9;

R_4 is H, Cl, Br, I, F, OR_8 or OH;

R_5 is R_3 or =O;

R_6 and R_7 are R_3 or COR_3;

R_8 is R_3, R_3CO, or R_3SO_2; and

R_9 is straight, branched, or cyclic alkyl group of from C_1 to C_{12}.

4,954,159

PHOSPHORYLAMINOPHENYLTETRAHYDROPHTHALIMIDE HERBICIDES

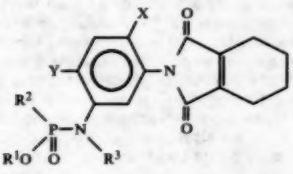
George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 259,073, Oct. 18, 1988, abandoned. This application Mar. 17, 1989, Ser. No. 326,450

Int. Cl.[5] A01N *57/32;* **C07F** *9/24;* **C07D** *209/48*

U.S. Cl. 71—86 **19 Claims**

1. A compound of the formula



in which

X and Y are independently F, Cl, or Br;

R^1 is selected from lower alkyl, lower haloalkyl, cycloalkyl of 3 to 7 ring carbon atoms, lower alkenyl, lower haloalkenyl, lower alkynyl, lower haloalkynyl, and benzyl which is unsubstituted or substituted on the phenyl ring with one or more substituents selected from halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, cyano, and nitro;

R^2 is independently selected from among —OR^1 or is hydroxy, amino, lower alkylamino, or lower dialkylamino; and R^3 is H, alkyl, or lower alkenyl; or

a base addition salt of the compound as defined above in which R^2 is hydroxy.

9. A herbicidal composition comprising an herbicidally effective amount of the compound of claim 1 in admixture with a suitable carrier.

4,954,160

OXIMINO ETHER COMPOUNDS

Terence Gilkerson, Canterbury, and Robert W. Shaw, Sittingbourne, both of England, assignors to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

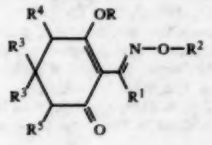
Filed Sep. 21, 1988, Ser. No. 247,273

Claims priority, application United Kingdom, Sep. 29, 1987, 8722838

Int. Cl.[5] A01N *43/40*

U.S. Cl. 71—88 **21 Claims**

1. A compound of the formula



(I)

wherein

R is selected from a hydrogen atom, an optionally substituted alkyl group, an optionally substituted acyl group, a C_{2-6} alkenyl group, a C_{2-6} alkynyl group, and an organic or inorganic cation selected from alkali and alkaline earth metal ions, transition metal ions, and ammonium ions optionally substituted with 1–4 groups selected from optionally substituted alkyl, phenyl and phenylalkyl groups,

R^1 is selected from alkyl, haloalkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, or an optionally substituted phenyl group,

R^2 is selected from cycloalkyl, C_{2-6} alkenyl or haloalkynyl, C_{2-6} alkynyl, or an optionally substituted alkyl group,

R^3 is an optionally substituted alkyl group,

one of R^4 and R^5 represents a hydrogen atom or an alkyl group while the other of R^4 and R^5 represents an optionally substituted phenyl group,

said optional alkyl substituents being selected from the group consisting of halogen, C_{1-6} alkoxy, C_{1-6} alkylthio, (C_{1-6} alkoxy)carbonyl and optionally substituted phenyl groups,

said optional phenyl substituents being selected from the group consisting of halogen, nitro, cyano, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-10} alkylene dioxy, C_{1-6} alkylthio and C_{2-6} alkenylthio and amino, acetamido, mono(C_{1-4}) alkylamino and di(C_{1-4}-alkyl)amino groups, and acyl groups,

said optionally substituted acyl group being selected from C_{2-6} alkanoyl and optionally substituted benzoyl groups, sulphonyl groups, sulphonamido groups of the formula $SO_2NQ^1Q^2$ wherein each of Q^1 and Q^2 independently represents a hydrogen atom or an alkyl group.

7. A herbicidal composition comprising at least one carrier and a herbicidally-effective amount of a compound of formula (I) as defined in claim 1.

4,954,161

HERBICIDAL COMPOSITION AND METHOD FOR SAFENING GRAMINEOUS CROPS AGAINST HETEROCYCLIC PHENYL ETHERS

Ronald S. Pidskalny, Edmonton, and Paul G. Kneeshaw, Saskatoon, both of Canada, assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 9, 1989, Ser. No. 294,855

Int. Cl.[5] A01N *43/56, 43/76*

U.S. Cl. 71—88 **7 Claims**

1. A herbicidal composition for controlling undesirable plant species, selected from the group consisting of wild oats, green foxtail and combinations thereof which are growing in barley comprising a fenoxaprop ethyl in combination with a difenzoquat salt wherein said composition protects said crop from injury.

3. A method for controlling undesirable plant species, se-

lected from the group consisting of wild oats, green foxtail and combinations thereof which are growing in the presence of barley, which comprises applying to the locus in which said barley is growing a herbicidally effective amount of fenoxaprop ethyl and a difenzoquat salt, wherein the herbicidal combination is safe for said barley.

4. A method for protecting barley from injury by fenoxaprop ethyl which comprises applying a difenzoquat salt with the fenoxaprop ethyl in a non-phytotoxic antidotal amount.

4,954,162
AZOLYMETHYL-CYCLOPROPYL CARBINOL DERIVATIVES

Klaus Stroech, Solingen; Dietmar Beilefeldt, Ratingen; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

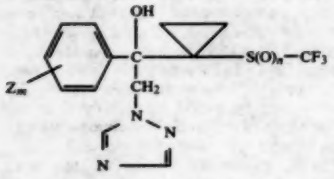
Filed Jun. 9, 1988, Ser. No. 204,470

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720756

Int. Cl.[5] A01N *43/653*; C07D *249/08*

U.S. Cl. 71—92 **12 Claims**

1. An azolylmethyl-cyclopropyl carbinol derivative of the formula



in which

Z is fluorine, chlorine or methyl,

m is 0,1,2 or 3, and

n is 0, 1 or 2, or an addition product thereof with an acid or metal salt.

4,954,163
SUBSTITUTED 1,2,4-TRIAZOLO[1,5-A]PYRIMIDINE-2-SULFONAMIDES, COMPOSITIONS CONTAINING THEM, AND THEIR UTILITY AS HERBICIDES

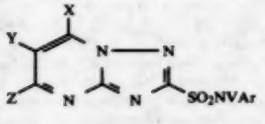
William A. Kleschik, Martinez, Calif.; Robert J. Ehr, Eden Prairie, Minn.; Mark J. Costales, Concord, Calif.; Ben C. Gerwick, III, Clayton, Calif.; Richard W. Meikle, deceased, late of Walnut Creek, Calif. (by Diane Meikle); William T. Monte, Corcord, Calif., and Norman R. Pearson, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 261,460, Oct. 21, 1988, Pat. No. 4,886,883, Division of Ser. No. 940,480, Dec. 10, 1986, Pat. No. 4,818,273, which is a continuation-in-part of Ser. No. 768,393, Aug. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 551,758, Nov. 14, 1983, abandoned. This application Sep. 13, 1989, Ser. No. 406,676

Int. Cl.[5] C07D *487/04*; A01N *43/54*

U.S. Cl. 71—92 **133 Claims**

1. A compound having the formula:



wherein Ar represents an aromatic or heteroaromatic ring chosen among phenyl; 1- or 2- naphthyl; 2-, 3-, or 4-pyridyl; 2- or 3- thienyl; 2- or 3-furyl; 2-, 4-, or 5-thiazoyl; 2, 4, or 5-imidazoyl; 2-, 4- or 5-oxazoyl; 3-, 4-, or 5-isothiazoyl; 3-, 4-, or 5-isoxazoyl; 3-, 4-, or 5-pyrazoyl; 2-benzthiazoyl; 2-benzoxazoyl; 2-benzimidazoyl; or 1-benztriazoyl; and Ar is unsubstituted except in the case of where Ar is phenyl or Ar is substituted with one to four substituents chosen from among C_1–C_6 alkyl; benzyl; halo; C_1–C_6 mono- or polyhaloalkyl; phenyl; phenyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; hydroxy; C_1–C_6 alkoxy; C_1–C_6 mono- or polyhaloalkoxy; phenoxy; phenoxy substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; 2-pyridyloxy; 2-pyridyloxy substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; amino; C_1–C_6 alkylamino; C_1–C_6 dialkylamino; nitro; C_1–C_6 alkylthio; C_1–C_6 polyhaloalkylthio; C_1–C_6 alkylsulfinyl; C_1–C_6 polyhaloalkylsulfinyl; C_1–C_6 alkylsulfonyl; C_1–C_6 polyhaloalkylsulfonyl; phenylthio; phenylthio substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; phenylsulfinyl; phenysulfinyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; phenylsulfonyl; phenylsulfonyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; cyano; carboxyl; C_1–C_{10} alkoxycarbonyl; phenoxycarbonyl; phenoxycarbonyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; alkoxyalkoxycarbonyl wherein the number of carbons in the alkoxyalkoxy fragment ranges from 2–10 and the number of oxygens in the alkoxyalkoxy fragment ranges from 2–4; 2-pyridylmethoxycarbonyl; dialkylaminoalkoxycarbonyl wherein the number of carbons in the dialkylaminoalkoxy fragment ranges from 3–10 and the number of oxygens in the dialkylaminoalkoxy fragment is one; C_3–C_6 alkenyloxycarbonyl; $COON=C(R^{14})(R^{14})$ wherein R^{14} independently represents hydrogen, C_1–C_6 alkyl or phenyl; amino-, C_1–C_6 alkylamino- or di C_1–C_6 alkylaminocarbonyl; C_1–C_{10} alkoxysulfonyl; C_1–C_4 polyhaloalkoxysulfonyl; di C_1–C_6 alkylaminosulfonyl; formyl; C_1–C_6 alkylcarbonyl; C_1–C_6 mono- or polyhaloalkylcarbonyl; phenylcarbonyl; phenylcarbonyl substituted with one or more groups chosen from halo, C_1–C_6 alkyl, or C_1–C_4 haloalkyl; or $C(R^{15})(R^{15})OR^{16}$ wherein each R^{15} independently represents hydrogen or C_1–C_6 alkyl and R^{16} represents hydrogen, C_1–C_6 alkyl, benzyl, phenylcarbonyl, or C_1–C_6 alkylcarbonyl; (except in the cases of thio, sulfinyl, and sulfonyl substituents where if one of these substituents is present the other one to three Ar substituents may not be chosen from among the other two; oxycarbonyl substituents where the other one to three Ar substituents may not be chosen from among different oxycarbonyl substituents or aminocarbonyl substituents where the other one to three Ar substituents may not be chosen from among different aminocarbonyl substituents); X, Y, and Z independently represent hydroxyl; carboxyl; hydrogen; C_1–C_6 alkyl; C_1–C_6 mono- or polyhaloalkyl; C_1–C_6 alkoxy; C_1–C_6 mono- or polyhaloalkoxy; amino; C_1–C_4 alkylamino; or di C_1–C_4 alkylamino; phenyl; phenyl substituted with one or more groups chosen from halo, nitro, C_1–C_6 alkyl, or C_1–C_6 mono- or polyhaloalkyl; C_1–C_6 alkylthio; or halo; or two adjacent substituents (i.e. X and Y or Y and Z) are joined together to form a five, six, or seven-membered saturated cyclic structure of carbon atoms or one said carbon atom of X,Y or Y,Z is replaced by a heteroatom chosen from among nitrogen, oxygen, and sulfur (i.e. X,Y or Y,Z is $-(CH_2)_n$ wherein n is 3, 4, or 5; or X,Y or Y,Z is $-(CH_2)_n-A-(CH_2)-_m$ wherein n is 0–4, the value of m is equal to the ring size minus (n+3) and A is NH, O, or S); and V is H or R and R represents C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, phenylalkyl, C_2–C_{10} alkanoyl, C_1–C_{10} alkoxycarbonyl, phenoxycarbonyl, di C_1–C_6 alkylaminocarbonyl, C_1–C_6 alkylsulfonyl, phenylsulfonyl, C_1–C_{10} alkoxythiocarbonyl or phenoxythiocarbonyl wherein alkyl, alkenyl, alkynyl and alkoxy in each instance is optionally substituted by halo and each phenyl moiety is optionally substituted by one or two groups selected from halo, nitro, C_1–C_4 alkyl, and C_1–C_4 haloalkyl; and, when V represents hydrogen, agriculturally acceptable salts thereof.

4,954,164

PYRAZOLESULFONYLUREA DERIVATIVES, PREPARATION THEREOF, HERBICIDE CONTAINING SAID DERIVATIVE AS ACTIVE INGREDIENT AND HERBICIDAL METHOD BY USE THEREOF

Fumio Suzuki, Onoda; Yoshihiro Iwasawa, Ichikawa; Toshiaki Sato, Funabashi; Takasi Ikai, Tokyo, and Tosihiko Oguti, Urawa, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,458

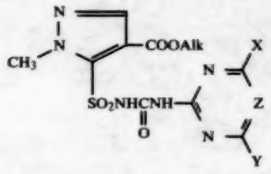
Claims priority, application Japan, Feb. 27, 1982, 57-31377; Aug. 18, 1982, 57-142069

Int. Cl.[5] A01N *43/54, 43/66;* C07D *239/47*

U.S. Cl. 71—92 5 Claims

1. A method of controlling the growth of undesired vegetation in rice growing sites without harming the rice plants which comprises applying to a rice growing site an effective amount of a compound of

the formula



wherein Alk is methyl or ethyl; X is methyl or methoxy; Y is methoxy; and Z is CH.

4,954,165

SUBSTITUTED BENZOYL DERIVATIVES AND SELECTIVE HERBICIDES

Masatoshi Baba; Takuya Kakuta; Norio Tanaka; Eiichi Oya, all of Funabashi; Takashi Ikai, Tokyo; Tsutomu Nawamaki, Shiraoka; Shigeomi Watanabe, Shiraoka, and Koichi Suzuki, Shiraoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

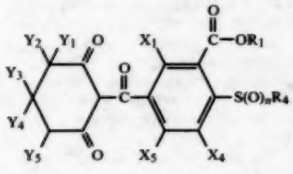
Filed Oct. 18, 1988, Ser. No. 259,587

Claims priority, application Japan, Oct. 19, 1987, 62-263060; Nov. 20, 1987, 62-293804

Int. Cl.[5] A01N *31/04, 37/34;* C07C *49/792, 43/21*

U.S. Cl. 71—103 5 Claims

1. A substituted benzoyl derivative having the formula:



wherein

X_1 is C_1–C_4 alkoxy or halogen;

X_4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen;

X_5 is hydrogen or fluorine;

Y_1, Y_2, Y_3, Y_4 and Y_5 are independently hydrogen or C_1–C_4 alkyl;

R_1 is C_1–C_4 alkyl;

R_4 is C_1–C_3 alkyl;

n is an integer of 0, 1 or 2.

2. The compound of claim 1 wherein:

X_1 is halogen;

X_4 is hydrogen;

X_5 is hydrogen;

Y_1, Y_2, Y_3, Y_4 and Y_5 are independently hydrogen or C_1–C_4 alkyl;

R_1 is C_1–C_4 alkyl;

R_4 is C_1–C_3 alkyl;

n is an integer of 0, 1 or 2.

3. The compound of claim 2 wherein:

X_1 is chlorine;

R_1 is methyl;

R_4 is methyl.

5. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of the compound of claim 3.

4,954,166

PRODUCTION OF SPONGE METAL FROM SPONGE METAL FINES

Hani A. M. Abodishish; Randy W. Wahlquist, both of Ogden, and Dale A. Lopez, South Weber, all of Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 17, 1989, Ser. No. 437,948

Int. Cl.[5] C22B *5/02*

U.S. Cl. 419—38 8 Claims

1. A process for the production of a sintered, coherent mass of sponge metal from sponge metal fines of a metal of a kind that can be produced in the form of sponge, comprising bringing said fines into contact with molten magnesium under conditions of temperature above the melting point of magnesium to wet the surfaces of said metal fines with said magnesium; lowering the temperature to or below the melting point of magnesium so as to solidify said molten magnesium; and sintering and fusing together the metal fines by raising the temperature to or above the vaporization point of the magnesium, thereby distilling off said magnesium.

4,954,167

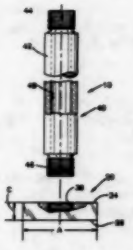
DISPERSING GAS INTO MOLTEN METAL

Paul V. Cooper, 8389 Sherman Rd., Chesterland, Ohio 44026

Division of Ser. No. 222,934, Jul. 22, 1988, Pat. No. 4,898,367. This application Jul. 10, 1989, Ser. No. 377,484

Int. Cl.[5] C22B *9/00*

U.S. Cl. 75—708 10 Claims



1. A method for dispersing gas into molten metal, comprising the steps of:

providing an impeller in the form of a rectangular prism having upper and lower faces, a width (A), a depth (B), and a height (C), with (A) being equal to (B), the impeller having a gas discharge outlet opening through the lower face of the prism;

providing an elongate, rotatable a shaft rigidly connected to the impeller and projecting from the upper face of the impeller;

providing means for conveying gas to the gas discharge outlet;

providing a vessel within which molten metal is contained;

immersing the impeller into the molten metal contained within the vessel;

rotating the shaft about its longitudinal axis; and

pumping gas through the gas discharge outlet while rotating the shaft.

4,954,168

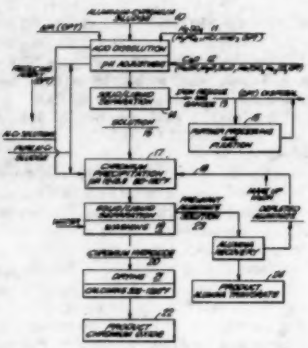
RECLAIMING OF ALUMINUM-CHROMIUM WASTE MATERIALS FROM ETCHING OPERATIONS

Ranko Crnojevich; Edward I. Wiewiorowski, both of New Orleans, and Andrew B. Case, Harvey, all of La., assignors to AMAX Inc., New York, N.Y.

Filed May 15, 1989, Ser. No. 352,301

Int. Cl.[5] C22B *3/00*; C01G *37/00*; C01F *7/00*

U.S. Cl. 423—55 **10 Claims**



1. A method for treating sludge containing substantial amounts of chromium, aluminum and iron which comprises:

forming a slurry of said sludge in water at a temperature ranging from ambient to about 150° F. with the specific gravity of the slurry ranging from about 1.02 to 1.25,

adding a mineral acid to said slurry to provide a pH ranging from about 0.1–3 to dissolve selectively said aluminum and said chromium and leave a solids residue containing gangue material comprising an oxidized iron compound, calcium sulfate, calcium fluoride, and calcium silicate,

controlling the pH of said solution at range of about 2 to 3.5 to precipitate the iron present, without substantially adversely affecting the dissolved chromium and aluminum,

separating said chromium/aluminum-containing solution from said solids therein to provide a substantially purified solution of chromium/-aluminum,

raising the pH of the solution to a range of about 12 to 13.8 to precipitate chromium as chromium hydroxide and provide a pregnant aluminate solution, and then subjecting said chromium hydroxide-containing solution to solid/liquid separation and thereby extract chromium hydroxide therefrom and provide a pregnant aluminate solution which is thereafter treated to recover alumina therefrom.

4,954,169

FINE-GRAINED, HIGH-PURITY EARTH ACID METAL POWDERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Dieter Behrens, Bad Harzburg, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 364,844

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3820960

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—228 **18 Claims**

1. Earth acid metal powders consisting of agglomerates for powder metallurgical applications for the production of sintered compacts, wherein the mean grain size of the agglomerates is no more than 2.0 μm, determined by the Fisher Sub-Sieve Sizer, and wherein the agglomerates consist of primary individual agglomerated particles of mean grain size of no more than 0.7 μm.

4,954,170

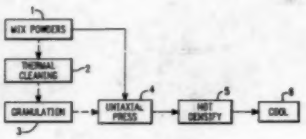
METHODS OF MAKING HIGH PERFORMANCE COMPACTS AND PRODUCTS

Maurice G. Fey, Plum Borough; Natraj C. Iyer, Monroeville; Alan T. Male, Murrysville Boro, and William R. Lovic, New Kensington, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 30, 1989, Ser. No. 374,324

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—229 **39 Claims**



1. A method of forming a pressed, dense compact, comprising the steps:

(1) providing a compactable particulate combination of:

(a) Class 1 metals selected from the group consisting of Ag, Cu, Al, and mixtures thereof, with

(b) material selected from the class consisting of CdO, SnO, SnO_2, C, Co, Ni, Fe, Cr, Cr_3C_2, Cr_7C_3, W, WC, W_2C, WB, Mo, Mo_2C, MoB, Mo_2B, TiC, TiN, TiB_2, Si, SiC, Si_3N_4, and mixtures thereof;

(2) uniaxially pressing the particulate combination, having a maximum dimension up to approximately 1,500 micrometers, to a density of from 60% to 95%, to provide a compact;

(3) placing at least one compact in an open pan having a bottom surface and containing side surfaces where the compact contacts a separation material which aids subsequent separation of the compact and the pan;

(4) evacuating air from the pan;

(5) sealing the open top portion of the pan, where at least one of the top and bottom surfaces of the pan is pressure deformable;

(6) stacking a plurality of the pans next to each other, with plates having a high electrical resistance disposed between each pan so that the pans and plates alternate with each other, where a layer of thermally conductive, granular, pressure transmitting material, having a diameter of up to approximately 1,500 micrometers, is disposed between each pan and plate, which granular material acts to provide heat transfer and uniform mechanical loading to the compacts in the pans upon subsequent pressing, and where the plates and the granular material used to provide uniform loading having a melting point above that of the lowest melting component used in the compacts;

(7) placing the stack in a press, passing an electrical current through the pans and high electrical resistance plates to cause a heating effect on the compacts in the pans, and uniaxial pressing the alternating pans and plates, where the pressure is between 352.5 kg/cm^2 (5,000 psi) and 3,172 kg/cm^2 (45,000 psi) and the temperature is from 0.5° C. to 100° C. below the melting point or decomposition point of the lowest melting component in the press, to provide uniform, simultaneous hot-pressing and densification of the compacts in the pans to over 97% of theoretical density;

(8) cooling and releasing pressure on the alternating pans and plates; and

(9) separating the pans from the plates and the compacts from the pans.

4,954,171

COMPOSITE ALLOY STEEL POWDER AND SINTERED ALLOY STEEL

Shigeaki Takajo; Osamu Furukimi; Kuniaki Ogura; Keiichi Maruta; Teruyoshi Abe, and Ichio Sakurada, all of Chiba, Japan, assignors to Kawasaki Steel Corp.

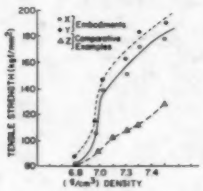
PCT No. PCT/JP88/01007, § 371 Date Jul. 14, 1989, § 102(e) Date Jul. 14, 1989, PCT Pub. No. WO89/02802, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 30, 1988, Ser. No. 381,652

Claims priority, application Japan, Sep. 30, 1987, 62-244074; Jun. 6, 1988, 63-137400

Int. Cl.[5] C22C *1/00*

U.S. Cl. 75—246 **15 Claims**



1. A composite alloy steel powder for powder metallurgy composed of iron powder particles and powdery alloy components attached by diffusion to parts of the surfaces of the iron powder particles, which comprises Ni and Mo as alloy components, said alloy powder comprising 0.05–3.50 wt. % of Ni, 0.65–3.50 wt. % of Mo, and the remainder of Fe and inevitable impurities, wherein the content of Ni and the content of Mo in the particles of alloy steel powder which have particle diameters smaller than 45 μm are in the range of 2.0–4.2 times the average content of Ni and of Mo in the entire alloy steel powder.

4,954,172

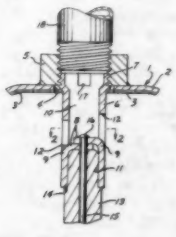
COMBINATION ANODE MOUNT AND HOT WATER OUTLET FOR WATER HEATER

Timothy H. Houle, Wauwatosa, and Robert M. Schurter, Elm Grove, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Aug. 7, 1989, Ser. No. 390,962

Int. Cl.[5] C23F *13/00*

U.S. Cl. 204—197 **9 Claims**



1. In a water heater, a tank to contain water to be heated and having an upper head, said head having an opening therein, an annular spud secured to the outer surface of said head in alignment with said opening, a tubular metal body having an upper end extending through said opening and connected to said spud, said body having a pair of opposed apertures, a tab integrally connected to the bottom edge of each aperture, said tabs extending transversely of said body and disposed in lapping relation to provide a wall dividing said body into an upper chamber and a lower chamber, heated water from the tank being adapted to be discharged through said apertures to said upper chamber, and an anode of a metal electro-negative to steel having an upper end disposed in said lower chamber and in electrical contact with said body.

4,954,173

LIPOPHOBICATING SOLUTION FOR ELECTROPHOTOGRAPHIC PLATES FOR OFFSET PRINTING

Hajime Yoshida, Nagoya, Japan, assignor to Nikken Chemical Laboratory Co., Ltd., Nagoya, Japan

Filed Nov. 8, 1988, Ser. No. 268,948

Claims priority, application Japan, Nov. 19, 1987, 62-292630

Int. Cl.[5] C09K *3/00*; B41M *5/025*

U.S. Cl. 106—2 **14 Claims**

1. A lipophobicating solution for an electrophotographic plate for offset printing, comprising:

(a) an effective amount of phytic acid to prevent oily printing ink from sticking to nonimage areas of the surface of said electrophotographic plate,

(b) an amount of a diamine, having the general formula NH_2—R—NH_2 wherein R is an alkyl or aryl group having from 2 to 8 carbon atoms, effective to adjust the pH of said lipophobicating solution to a valve in the range of from about 3.0 to about 6.0, and

(c) water, and

(d) at least about 60 mol % by weight, based on said phytic acid, of a mixture of at least two dicarboxylic acids selected from the group consisting of carboxylic acids represented by the formula HOOC—$(CH_2)_n$—COOH (wherein n is an integer in the range of 1 to 6) and phthalic acid.

4,954,174

ERASABLE INK COMPOSITIONS

Kiyotaka Imagawa, Osaka, Japan, assignor to Sakura Color Products Corporation, Osaka, Japan

Filed Aug. 24, 1988, Ser. No. 235,569

Claims priority, application Japan, Aug. 24, 1987, 62-209545

Int. Cl.[5] C09D *11/16*; C09K *3/00*

U.S. Cl. 106—27 **7 Claims**

1. An erasable ink composition for use in writing with a marking pen which comprises an organic solvent, optionally a resin soluble in the solvent, a pigment dispersed in the solvent and additives, the improvement in the additives comprising:

(a) a fatty acid monoester of an aliphatic alcohol wherein the fatty acid has not less than six carbons in amounts of about 0.5–20% by weight;

(b) a fatty acid triglyceride in amounts of about 0.5–20% by weight;

(c) a higher aliphatic hydrocarbon which is liquid at normal temperatures in amounts of about 0.2–5% by weight; and

(d) a polyoxyethylene alkyl ether phosphoric acid ester in amounts of about 0.5–7% by weight; each based on the ink composition.

4,954,175

PIGMENT

Hiroshi Ito, Ichinomiya; Junichi Handa, Toyota; Yoshio Takagi, Nagoya, and Taketoshi Minohara, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 7, 1989, Ser. No. 306,980

Claims priority, application Japan, Jul. 20, 1988, 63-181215; Jan. 25, 1989, 64-15385

Int. Cl.[5] C04B *14/20*

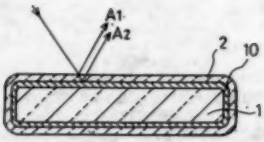
U.S. Cl. 106—417 **11 Claims**

1. A pigment comprising:

a substrate;

a transparent inorganic compound layer formed on a surface of said substrate; and

a metallic layer having metallic luster formed in a scattered manner on an interface between said substrate and said transparent inorganic compound layer,



whereby said pigment produces color by light interference of a ray reflected on a surface of said transparent inorganic compound layer and a ray passed through said transparent inorganic compound layer and reflected on a surface of said metallic layer.

4,954,176

PIGMENT

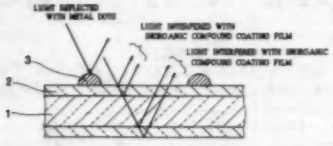
Taketoshi Minohara, Toyota; Yoshio Takagi, Nagoya; Tadashi Isobe, and Keita Suzuki, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 3, 1988, Ser. No. 252,313

Claims priority, application Japan, Oct. 21, 1987, 62-265795

Int. Cl.[5] C04B *14/00*

U.S. Cl. 106—417 **27 Claims**



17. A pigment comprising:

a ceramic scaly substrate;

a transparent inorganic compound coating film formed on all over the surfaces of said ceramic scaly substrate;

a transparent coloring film formed on all over the surfaces of said inorganic compound coating film; and

metal dots or metal alloy dots formed on the surfaces of said coloring film in a ratio of from 0.05 to 95% of the total surface area of said coloring film.

4,954,177

DISPERSION

John D. Schofield, Bury, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 22,091, Mar. 5, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 238,607

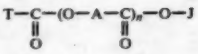
Claims priority, application United Kingdom, Mar. 26, 1986, 8607596

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[5] C08K *5/09*; C09C *3/00*

U.S. Cl. 106—499 **16 Claims**

1. A composition comprising a finely-divided ceramic solid whereof the primary particles have a mean diameter of below 25 microns and a dispersant which is an organic comound of the formula



wherein

A is a divalent aliphatic radical containing 17 carbon atoms;

J is a hydrogen, a metal, ammonium, or substituted ammonium;

T is an optionally substituted alkyl, cycloalkyl, polycycloalkyl, aryl or polyaryl group wherein the optional substituent is at least one group selected from hydroxy, halo and alkoxy groups; and

n has a value from 1 up to 3.

4,954,178

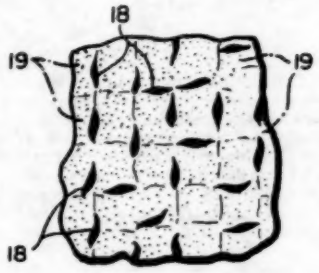
STARCH HYDROLYZATE PRODUCT

Dennis W. Caton, Marion, Iowa, assignor to Penford Products Co., Cedar Rapids, Iowa

Division of Ser. No. 170,705, Mar. 19, 1988, Pat. No. 4,810,307, which is a continuation of Ser. No. 436, Jan. 5, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 263,286

Int. Cl.[5] C13F *3/02*; C08B *30/00*

U.S. Cl. 127—32 **10 Claims**



1. A starch hydrolyzate product produced by the partial hydrolysis of cereal and root based starches and composed of particles at least some of which are in the size range −30 to 80 mesh, wherein:

the untapped bulk density of said product for particles thereof in the size range −80 to +80 mesh is greater than 0.5 g/cc;

and a substantial portion of said particles have a surface topography comprising cracks, crevices and fissures into which liquid can infiltrate to increase the speed of dissolution of said particles compared to particles of the same size without said surface topography;

said starch hydrolyzate product being the product of a process comprising the steps of:

mixing particles of a starch hydrolyzate product produced by the partial hydrolysis of cereal and root based starches with an added liquid which will occupy spaces between the particles when they are compacted;

forming a blend of said particles and said added liquid as a result of said mixing step;

providing said blend with a water content derived from the bound water in said particles and the water in said added liquid;

controlling said water content of the blend, by controlling the amount of said added liquid and the concentration thereof, so that the blend's total water content is greater than 3 wt. % and no greater than about 7 wt. %;

compacting said blend of particles and liquid between a pair of compacting rolls to form a sheet of compacted material composed of formerly discrete starch hydrolyzate particles crushed together, with said liquid occupying spaces between said crushed-together particles;

breaking said sheet of compacted material, after said compacting, into compacted particles of said material, wherein at least a substantial portion of said particles have a surface topography comprising cracks, crevices and fissures as a result of said above-recited steps;

and drying said material after said breaking to eliminate said liquid which occupied the spaces between the particles;

said liquid being one which has the ability to blend with said particles and to lubricate said compacting rolls and which is more volatile than water to facilitate the removal of the liquid during said drying step;

said liquid being selected from the group consisting of ethyl alcohol, acetone, hexane, cyclohexane, methyl ethyl ketone, ethyl acetate, propyl alcohol, butyl alcohol and pentyl alcohol.

4,954,179

METHOD AND APPARATUS FOR CLEANING A PIPE SYSTEM PROVIDED FOR THE OPERATION OF BATHS

Thomas K. Fränninge, Luks Road Old Windsor, Berkshire SL4 2QX, Great Britain

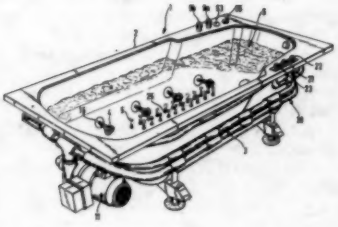
Continuation of Ser. No. 70,222, Jul. 6, 1987, Pat. No. 4,857,112. This application Apr. 5, 1989, Ser. No. 333,586

Claims priority, application Sweden, Jul. 7, 1986, 8603014; Oct. 3, 1986, 8604204; Feb. 23, 1987, 8700739

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—22.12 **14 Claims**



1. A method of cleaning a pipe system for a bathtub comprising flushing the pipes in the pipe system with water from a water source after a bath has been taken, wherein the flushing water is taken from a water source which is the same water source which supplies the bathtub with bath water, thereby using the water pressure of the source, and wherein flushing water is delivered to the conduits by flushing jets from a plurality of successive sections within the conduits and directed substantially in a transverse direction towards the inner surfaces of said conduits at a pressure so as to hit the inner surfaces of the conduits with sufficient force to dislodge impurities situated on the inner surface of the conduits before said impurities have dried on the inner surface of said conduits.

4,954,180

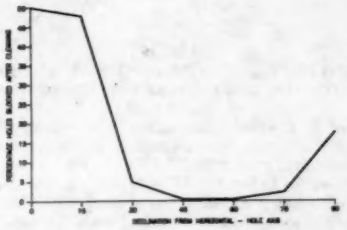
METHOD FOR CLEANING SPINNERETTES

James C. Malloy, 404 W. Saratoga, Ferndale, Mich. 48220, assignor to James Christopher Malloy, Ferndale, Mich.

Continuation-in-part of Ser. No. 50,008, May 15, 1987, abandoned. This application Jun. 9, 1988, Ser. No. 204,595

Int. Cl.[5] B08B *3/10*

U.S. Cl. 134—22.13 **17 Claims**



1. A method of cleaning organic material from the orifices of spinnerettes comprising the steps of:

immersing the spinnerette in a fused oxidizing salt bath maintained between about 500° F. and 900° F., positioning the spinnerette in a position with the orifices extending at an angle of from about 30° to about 75° with respect to the horizontal to allow trapped gases to escape, and with the inlet ends of the orifices oriented upwardly;

removing the spinnerette from the bath, and

quenching the spinnerette.

4,954,181

SOLAR CELL MODULE AND METHOD OF MANUFACTURE

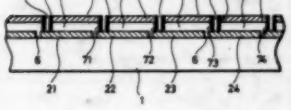
Masakaru Nishiura; Takeshige Ichimura, and Michinari Kamiyama, all of Yokosuka, Japan, assignors to Fuji Electric Company Ltd. and Fuji Electric Corporate Research and Development Ltd., Japan

Filed Sep. 25, 1985, Ser. No. 780,093

Claims priority, application Japan, Oct. 5, 1984, 59-209212; Oct. 12, 1984, 59-213736

Int. Cl.[5] H01L *31/042, 31/18*

U.S. Cl. 136—244 **3 Claims**



1. A solar cell module, comprising:

an insulating substrate carrying a transparent electrode on one surface;

an amorphous semiconductor film overlying said transparent electrode;

a metal electrode layer overlying said semiconductor film;

each of said electrode, film and layer being divided into regions to form a plurality of adjacent cells, said divided regions of the transparent electrode and said metal layer being in positions shifted from one another to define a gap between adjacent cells; and

said semiconductor film having a portion projecting into said gap from between said transparent electrode and said metal layer, said projecting portion being crystallized

after assembly of the electrode, film and metal layer so as to form a low resistivity connection between the metal electrode layer of one cell and the transparent electrode of an adjacent cell.

4,954,182

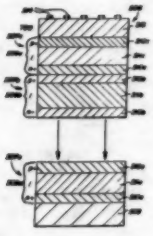
MULTIPLE CELL PHOTORESPONSIVE AMORPHOUS PHOTO VOLTAIC DEVICES INCLUDING GRADED BAND GAPS

Stanford R. Ovshinsky, Bloomfield Hills, Mich., and David Adler, Lexington, Mass., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 710,947, Mar. 13, 1965, Pat. No. 4,891,074, which is a continuation of Ser. No. 427,757, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 206,580, Nov. 13, 1980, abandoned. This application Mar. 13, 1989, Ser. No. 301,916

Int. Cl.[5] H01L *31/06*

U.S. Cl. 136—249 **8 Claims**



1. An improved photoresponsive tandem multiple cell device, said device comprising:

at least first and second superimposed solar cells;

said first cell being formed of an amorphous silicon alloy material;

said second amorphous silicon alloy cell having an active photoresponsive region in which radiation can impinge to produce charge carriers, said amorphous silicon alloy cell body including at least one element for reducing the density of defect states to about 10^{16} defects per cubic centimeter and a band gap adjusting element graded through at least a portion of the photoresponsive region thereof to enhance the radiation absorption;

said adjusting element being germanium, and the band gap of said cell being adjusted for a specified photoresponse wavelength threshold function different from said first cell;

said second cell being a multi-layer body having deposited silicon alloy layers of opposite (p and n) conductivity type, the n-type layer being formed by introducing during the deposition of the layer an n-dopant element and the p-type layer being formed by introducing during deposition of the layer a p-dopant element, and having deposited between said p and n doped layers said active photoresponsive region formed of substantially intrinsic amorphous silicon alloy; and

said first cell being formed with said second cell in substantially direct junction contact therebetween, said first and second cells designed to generate substantially matched currents from each cell from a light source directed through said first cell and into said second cell.

4,954,183

LEAD HEAT TREATMENT OF WIRE WITH PREVENTION OF LEAD ENTRAINMENT

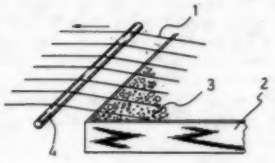
Marc DeWitte, Moen, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Mar. 22, 1989, Ser. No. 327,086

Claims priority, application European Pat. Off., Apr. 25, 1988, 88200789.1

Int. Cl.[5] C21D *1/48, 9/58;* **C23C** *2/18, 2/20*

U.S. Cl. 148—15 **11 Claims**



1. A process of heat treatment of at least one elongated steel element consisting essentially of:

conducting said elongated steel element through a bath of molten lead, and

immediately upon exit from said bath of molten lead, contacting said elongated steel element with an amount of a substance that is capable of transforming lead oxide to lead or a lead compound sufficient to reduce lead entrainment on said elongated steel element at the exit conditions of said elongated steel element from said bath of molten lead.

4,954,184

SOLDER TINNING PASTE FOR AUTOMOLBILE APPLICATION

Paul J. Conn, Grand Island, N.Y., assignor to S. A. Day Manufacturing Co., Inc., Buffal, N.Y.

Filed May 17, 1989, Ser. No. 353,340

Int. Cl.[5] B23K *35/34*

U.S. Cl. 148—24 **21 Claims**

1. Solder tinning paste composition suitable for use as an underlay for metallic solder when solder filling base metal braze joints to facilitate formation of the solder joint between the base metals, said paste exhibiting a melting point lower than 450° F., said paste consisting essentially of:

from about 35.0 weight percent to about 85.0 weight percent substantially pure tin powder;

from about 0.25 weight percent to about 3.0 weight percent suspending agent;

from about 4.0 weight percent to about 15.0 weight percent inorganic based flux; and

from about 10.0 weight percent to about 40.0 weight percent solvent.

4,954,185

METHOD OF APPLYING ADHERENT COATING ON COPPER

Thomas S. Kohm, Huntington, N.Y., assignor to Kollmorgen Corporation, Simsbury, Conn.

Division of Ser. No. 282, Jan. 14, 1987, Pat. No. 4,774,279. This application Jul. 7, 1988, Ser. No. 216,117

Int. Cl.[5] C23C *8/10*

U.S. Cl. 148—282 **11 Claims**

1. A method of adherently bonding a primer coating composition to a surface, at least a portion of the surface being a metal, comprising:

removing essentially all soil from the surface, and removing all oxides and oxide films from the surface of the metal to expose a substantially pure metallic surface;

dehydrating the surface before the formation of a metallic oxide film greater than about 2.5 nm thick;

thereafter applying the primer coating composition to the surface before said metallic oxide film grows to greater than 2.5 nm, said primer coating composition including the product of reacting between 20 to 60% by weight of a poly(vinyl acetal) resin with 80–40% by weight of a thermosetting phenolic resin in the presence of an acidic catalyst, between 0.3 and 2% of a coupling agent having one to three amino substituted aromatic groups covalently bonded to a titanium or zirconium central atom via an oxygen containing linkage and an organic solvent; and

heat curing the primer coating composition on the surface at a temperature below 200° C., the cured coating being capable of maintaining the adhesion, essentially without outgassing, for at least 10 seconds when heated at 250° C.

4,954,186

REAR EARTH-IRON-BORON PERMANENT MAGNETS CONTAINING ALUMINUM

Mohammad H. Ghandehari, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 869,045, May 30, 1986. This application Apr. 4, 1988, Ser. No. 177,094

Int. Cl.[5] **H01F** *1/04*

U.S. Cl. 148—302 **28 Claims**

1. A rare earth-iron-boron permanent magnet containing aluminum and added rare earth oxide prepared by the method comprising the steps of:

(a) mixing (1) a particulate alloy, containing at least one rare earth metal, iron, and boron, with (2) particulate aluminum and (3) about 0.5 to about 10 weight percent of particulate rare earth oxide, calculated by weight of said particulate alloy;

(b) aligning magnetic domains of the mixture in a magnetic field;

(c) compacting the aligned mixture to form a shape; and

(d) sintering the compacted shape; and wherein said permanent magnet comprises a rare earth metal, iron, boron, added rare earth oxide and about 0.05 to about 1.0 percent by weight of aluminum.

4,954,187

PRECIPITATES COPPER-ZINC ALLOY WITH NICKEL SILICIDE

Norbert Gaag, Leinburg, and Peter Ruchel, Lauf/Pegn., both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 20, 1988, Ser. No. 260,199

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735783

Int. Cl.[5] **C22F** *1/08*

U.S. Cl. 148—413 **5 Claims**

1. A copper-zinc alloy, consisting essentially of 50 to 60 wt. % copper 1 to 6 wt. % aluminum, 0.5 to 5 wt. % silicon, 5 to 8 wt. % nickel, 0 to 1 wt. % iron, 0 to 2 wt. % lead, 0 to 2 wt. % manganese, with the remainder being zinc, said nickel being primarily present in an intermetallic composition with silicon as nickel-silicides, which are present in a rounded off shaped finely and uniformly distributed form, said allow having a good load carrying capacity, a high resistance to wear and possessing a uniformly high coefficient of friction.

4,954,188

HIGH STRENGTH ALUMINUM ALLOY RESISTANT TO EXFOLIATION AND METHOD OF MAKING

Basil M. Ponchel, Tarentum, and James D. Walsh, Cheswick, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 85,666, Aug. 13, 1987, Pat. No. 4,828,631, which is a continuation-in-part of Ser. No. 630,998, Jul. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 333,684, Dec. 23, 1981, abandoned. This application Dec. 7, 1988, Ser. No. 280,876

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] **C22C** *21/10*; **C22F** *1/053*

U.S. Cl. 148—417 **17 Claims**

10. An improved aluminum alloy product having a compressive yield strength of at least 77 ksi and improved resistance to exfoliation comprising an aluminum-base alloy consisting essentially of: 5.9 to 8.2 wt. % zinc, 1.5 to 3 wt. % copper, 1.5 to 4 wt. % magnesium, 0.05 to 0.25 wt. % zirconium, 0.1 wt. % max. manganese, less than 0.01 wt. % boron, not more than 0.04 wt. % chromium, not more than 0.06 wt. % titanium, not more than 0.12 wt. % silicon, not more than 0.15 wt. % iron, the balance comprising aluminum, said alloy being hot worked, solution heat treated, quenched, then aged, within a temperature range of about 265° F. to 290° F. for about 6 to 60 hours.

4,954,189

SILICON WAFERS FOR PRODUCING OXIDE LAYERS OF HIGH BREAKDOWN STRENGTH AND PROCESS FOR THE PRODUCTION THEREOF

Peter Hahn, Burghausen; Hubert Piontek, Burgkirchen; Anton Schnegg, and Werner Zulehner, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronic-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,395

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737815

Int. Cl.[5] **H01L** *21/304, 21/306, 21/322*

U.S. Cl. 148—33.2 **18 Claims**

1. A process for producing an oxide layer of high breakdown strength on a semiconductor wafer having an interior thereof exhibiting regions of gettering action, which has been produced by a heat treatment, comprising the steps of:

heating the semiconductor wafer to produce oxygen precipitations exhibiting an intrinsic gettering action in the interior of the semiconductor wafer;

smoothing at least one surface of the semiconductor wafer to reduce surface irregularities; and

heating the semiconductor wafer in an oxygen-container atmosphere for a predetermined time to form the oxide layer on said at least one surface after smoothing thereof.

16. A silicon wafer comprising:

an interior containing oxygen precipitations exhibiting an intrinsic gettering action; and,

a front side and a rear side, at least one of said front side or said rear side having been given a polishing treatment before the formation of said interior and a smoothing treatment after the formation of said interior.

4,954,190

METHOD AND MEANS FOR SUPPLYING AND USING ARTIFICIAL FINGERNAIL MATERIAL

Sandra D. Taeckens, 77811 Calle Sinaloa, La Quinta, Calif. 92253

Filed May 18, 1989, Ser. No. 353,867
Int. Cl.[5] B32B *31/12*; A45D *31/00*
U.S. Cl. 156—61 **3 Claims**

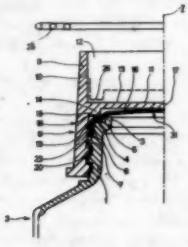
1. The method of supplying artificial fingernail fabric material for use in creating artificial fingernails comprising: cutting a sheet of fabric material suitable to be used in creating artificial fingernails to a desired shape from which a multiplicity of individual artificial fingernail segments may be cut; mounting the cut piece of artificial fingernail fabric material upon a backing board along one edge thereof; die-cutting said fabric material upon said board in such manner as to cut the material into pre-determined fingernail shapes, leaving a very small portion of the die-cut shaped segment attached to the fabric material; premarking and scoring a plastic envelope of suitable size to contain the die-cut fabric material upon its backing board in such manner that individual strips may be removed from said plastic envelope; enclosing the die-cut fabric material upon its backing board within said plastic envelope; removing the die-cut fabric on its backing board from the plastic envelope when desired to use the material; taking an individual die-cut fingernail segment from the fabric material and tearing it from its joinder to the basic fabric sheet; and applying the individual segment to a natural fingernail.

4,954,191

PACK COMPRISING A TUBE, A SCREW CAP AND A COVER TO WELD OVER THE NECK OF THE TUBE, AND A METHOD OF SEALING SAID TUBE

Frédéric Delespaul, and Bernard Schneider, both of Sainte-Ménéhould, France, assignors to Cebal, Clichy, France

Division of Ser. No. 274,953, Nov. 22, 1988, Pat. No. 4,893,718.
This application Jun. 28, 1989, Ser. No. 372,548
Claims priority, application France, Dec. 23, 1987, 87 18527
Int. Cl.[5] B32B *31/20*; B65D *41/62*
U.S. Cl. 156—69 **5 Claims**



1. A method of sealing a tube (2) with a plastic neck (1) using a cap (8) also made of plastic and a cover, comprising the steps of:

(a) providing a deformable laminate with little or no spring-back effect comprising at least 2 external layers based on plastics and a barrier layer, the laminate being from 0.10 to 0.40 mm thick;

(b) cutting a cover (21) out of the laminate, the cover having a circular outline (22) with a diameter between the outside diameter of the end (4) of the neck (1) minus 0.3 mm and that diameter plus 0.5 mm, and comprising a radially projecting tab 23 or a plurality of regularly spaced radially projecting tabs (23), the cover (21) being of a type which can straddle a burr (5) on the neck (1) without any risk of bursting;

(c) preparing a tube (2) with a screw thread on the neck (1) and the cap (8), the end (13) of the cap having a peripheral shoulder (14) to bear on the end (4) of the neck (1), the inside diameter of the shoulder (14) being between the inside and outside diameters of the neck (1) and being chosen so that it does not bear on burrs (5) not cut off at the end of the neck (1) and hence does not press the cover (21) onto such a burr (5), the outside of the neck and the inside of the cap below that shoulder having a space between them which can contain the tab or tabs (23) projecting from the cover (21);

(d) arranging the cover (21) at or near the end (13) of the cap (8), the circular portion of the cover being centered therein and its projecting tab or tabs being bent back towards the inside lateral surfaces (19 and 20) of said cap (8);

(e) screwing the cap thus fitted with the cover (21) right down onto the neck (1) of the tube; and

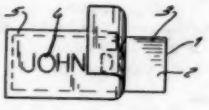
(f) welding the cover (21) onto the end (4) of the neck (1) either by induction or by ultrasound, according to the nature of the cover (21).

4,954,192

PROCESS FOR APPLYING IDENTIFICATION TO OBJECTS MADE OF POROUS MATERIAL

John T. Dziekan, Racine, Wis., assignor to Pristine Products, Racine, Wis.

Filed Aug. 30, 1989, Ser. No. 400,673
Int. Cl.[5] B05D *1/32, 3/00*; B29C *39/12*; B44C *1/22*
U.S. Cl. 156—154 **11 Claims**



1. A process for applying a permanent filled engraved identification to the surface of an object made of porous material comprising the steps of:

A. coating said surface on which the identification is to be applied with a water soluble sealant of sodium silicate and allowing said coating to dry; applying a second coat of sodium silicate and allowing it to dry;

B. placing a perforated stencil on said surface to provide an opening defining the identification to be applied;

C. removing said soluble sealant coating and a portion of said porous material from said stencil opening and to a desired depth in said object to provide an engraved identification in said object;

D. removing said stencil from said object;

E. applying a flowable epoxy resin to said engraved identification, which resin will set in and fill said engraved identification;

F. allowing said resin to set; and

G. applying water to said object for a period of time sufficient to dissolve said water soluble sealant and cause any of said resin which is not in said engraved identification to be released and removed from said surface o said object.

4,954,193

METHOD FOR MAKING A GRAPHITE FILM OR SHEET

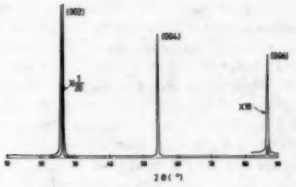
Mutsuaki Murakami, Tokyo; Naomi Nishiki, Kyoto; Susumu Yoshimura, Yokohama, and Kazuhiro Watanabe, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Research Development Corporation of Japan, Tokyo, both of, Japan

Filed Aug. 26, 1988, Ser. No. 236,999

Claims priority, application Japan, Aug. 26, 1987, 62-212112; Aug. 26, 1987, 62-212113

Int. Cl.[5] B32B *31/20, 31/26*

U.S. Cl. 156—155 12 Claims



1. A method for marking a graphite sheet or block which comprises:

(a) providing at least two films made of a polymer selected from the group consisting of a polyoxadiazole, an aromatic polyimide and an aromatic polyamide, said at least two films having, respectively, a thickness not greater than 400 micrometers; and

(b) pressing the at least two films at a pressure of not lower than 4 kg/cm^2 at a temperature of not lower than 2200° C. for a time sufficient to graphitize the at least two films in an inert gas, thereby obtaining a graphite sheet or block.

4,954,194

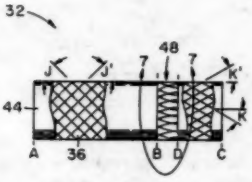
METHOD FOR MAKING AN AIRSPRING AND SLEEVE

Michael L. Crabtree, Arvada, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 32,212, Mar. 30, 1987, Pat. No. 4,763,883. This application May 23, 1988, Ser. No. 197,376

Int. Cl.[5] B65H *54/02;* B29D *23/00*

U.S. Cl. 156—175 13 Claims



1. In a method of making an airspring sleeve by embedding successive layers of cord at opposite helical angles in an elastomer and forming a chamber portion and a rolling lobe portion intermediate opposite ends of the sleeve, the improvement comprising the step of:

winding cord of successive layers at inconstant helical angels intermediate ends of the sleeve and in an annular band portion of one of the sleeve chamber and rolling lobe portions from first opposite helical angles to second opposite helical angles.

4,954,195

PRODUCTION OF THERMOSET COMPOSITES CONTAINING THERMOPLASTIC FILLERS

Russell L. Turpin, Canyon Country, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Feb. 13, 1989, Ser. No. 309,579

Int. Cl.[5] B29C *43/20*

U.S. Cl. 156—242 14 Claims

1. In a process for producing thermoset composites, the steps which comprise:

providing a suitable thermoplastic resin composition comprised of particles of a suitable thermoplastic resin having a particle size ranging from about 10 to about 80 microns,

providing a base thermosetting resin curable by heating, said thermoplastic resin being insoluble in said thermosetting resin at room temperature and at elevated processing temperatures prior to curing, but soluble in said thermosetting resin at cure conditions thereof, and

mixing said particles of thermoplastic resin and said thermosetting resin in liquid form in a proportion of about 5% to about 40% of said thermoplastic resin, by weight of said mixture, and forming a substantially uniform dispersion of said thermoplastic resin particles and said thermosetting resin, said particles of thermoplastic resin being substantially non-agglomerating in said thermosetting resin.

4,954,196

PROCESS FOR CURING EPOXY RESIN ANHYDRIDE BLENDS AT MODERATELY ELEVATED TEMPERATURES

Ronald L. De Hoff, 43 Dickman Dr., Lavallette, N.J. 08735

Filed Aug. 30, 1989, Ser. No. 400,433

Int. Cl.[5] C08G *59/42*

U.S. Cl. 156—169 14 Claims

1. A process for curing an epoxy resin-acid anhydride blend at moderately elevated temperatures comprising the steps of:

(a) reacting an epoxy compound and a polyol for about 1 to 4 hours at elevated temperatures to produce a resinous polyol;

(b) mixing an acid anhydride with the resinous polyol from step (a);

(c) adding the anhydride-resinous polyol mixture from step (b) to an epoxy resin which has been heated to about 50° C. to reduce its viscosity; and

(d) heating the mixture from step (c) at from 60° C. to 90° C. for one hour to effect cure.

4,954,197

PROCESS FOR ASSEMBLING SMALLER ARRAYS TOGETHER TO FORM A LONGER ARRAY

Josef E. Jedlicka, Rochester; Ewart O. LeBlanc, Fairport, and Judith A. Masseth, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1989, Ser. No. 330,664

Int. Cl.[5] B32B *31/20, 31/28*

U.S. Cl. 156—273.7 6 Claims

1. A method of fabricating a full width array comprised of a plurality of discrete chips mounted on an elongated substantially non-transparent substrate in end-to-end abutting relation to one another, comprising the steps of:

(a) applying a discrete amount of heat activated adhesive to said substrate where each of said chips is to be mounted,

said heat activated adhesive being electrically conductive to allow electrical contact of said chips with said substrate;

(b) applying a discrete amount of a photocurable adhesive to said substrate adjacent to and spaced from each of said heat activated adhesive amounts,

said photocurable adhesive amounts being located so that on mounting of said chips on said substrate, an exterior fillet-like mass of photocurable adhesive is created forming an adhesive bridge spanning between at least one side of said chips and said substrate;

(c) mounting said chips on said substrate over said heat activated and said photocurable adhesives;

(d) exposing said photocurable adhesive to ultraviolet light whereby the portion of said photocurable adhesive forming said adhesive bridge is cured to temporarily bond said chips to said substrate;

(e) heating said heat activated adhesive to permanently bond said chips in position on said substrate.

4,954,198

METHOD OF FABRICATING GOLF CLUBS AND ASSEMBLY OF TUBES FOR FORMING CLUBS OBTAINED BY THE METHOD

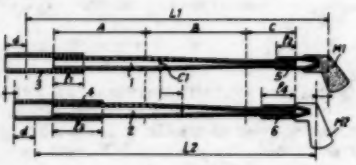
Paul H. Viellard, 22 rue Spontini, F-75116 Paris, France

Continuation-in-part of Ser. No. 5,161, Feb. 2, 1987, abandoned. This application Dec. 20, 1988, Ser. No. 286,815

Claims priority, application France, Apr. 19, 1985, 85 05968; May 2, 1985, 85 06638; May 15, 1985, 85 07346; PCT Int'l Appl., Apr. 11, 1986, FR86/0019

Int. Cl.[5] B32B *27/04*

U.S. Cl. 156—294 **7 Claims**



1. A method of producing a set of golf clubs, all having the same flexibility, in order to obtain a frequency matching, comprising the steps of:

(a) forming the shaft of each club from three different tubes including an intermediate tube having cylindrical ends made from synthetic fibers,

(b) fitting the ends of said intermediate tube in the other two tubes, from which one other tube forms a support for the head of the club and the second other tube forms a handle,

(c) varying the amount of overlap of the tubes which are fitted together to hold the vibration frequency of the club constant for said set of golf clubs,

(d) bonding said tubes together in the area of said overlap, and

(e) varying the vibration frequency from a first set of clubs to another set of clubs dependent on the desired flexibility required by the player.

4,954,199

TWO COMPONENT POLYURETHANE ADHESIVE

Randall C. Rains; Jeffrey F. Dormish, both of Pittsburgh; Susan A. Stanton, Evans City, all of Pa., and James N. Rieck, Wheeling, W. Va., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 925,002, Oct. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 868,866, May 30, 1986, abandoned. This application Jul. 23, 1987, Ser. No. 76,951

Int. Cl.[5] C09J *3/14*

U.S. Cl. 156—331.7 **3 Claims**

1. A method for bonding laminae comprising applying to at least one surface to be bonded an adhesive comprising the reaction product of (a) 100 parts by weight of at least one hydroxy functional material having a molecular weight of at least 300 and a functionality of at least 2; (b) about 0.2 to about 20 parts by weight of at least one member selected from the group consisting of isophorone diamine, methylene bis(cyclohexyl amine), diethyl-toluene diamine, diethylene triamine and 1-methyl-3,5-diethyl-2,4-diaminobenzene said member having a molecular weight of at least 60 ; and (c) an organic isocyanate in a sufficient amount to render the isocyanate index of the adhesive about 70 to about 150; said reaction product being further characterized in that said (c) is not prereacted with any of said (a) and (b).

4,954,200

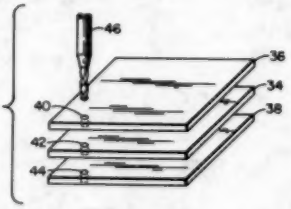
METHOD OF MAKING DRILL BACK-UP MATERIAL FOR SMALL BORE DRILLING OF CIRCUIT BOARDS

Carl E. Trewiler, Coshocton, Ohio, assignor to The General Electric Company, Worthington, Ohio

Division of Ser. No. 118,990, Nov. 10, 1987. This application Dec. 22, 1988, Ser. No. 289,568

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—344 **6 Claims**



1. In a method for small bore drilling of a workpiece wherein back-up sheets are placed on both sides of said workpiece during said drilling, the improvement for making said back-up sheets for backing said workpiece during said small bore drilling process which comprises:

(a) disposing the uncured ingredients for said sheet on the matte side of an electrodeposited metal foil;

(b) pressing and heating the ingredients/foil formed in step (a) to at least partially cure said ingredients for forming said sheet; and

(c) removing said metal foil from said sheet for said sheet to be used as a backing during said small bore drilling process.

4,954,201

APPARATUS FOR ETCHING SUBSTRATES WITH A LUMINOUS DISCHARGE

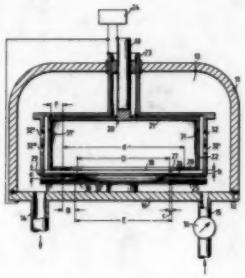
Rudolf Latz, Rodgau-Dudenhofen, and Thomas Martens, Krombach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau I, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,137

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3855153

Int. Cl.[5] H01L *21/306*; C23C *14/34*

U.S. Cl. 156—345 6 Claims



1. Apparatus for etching substrates with a luminous discharge in a vacuum, comprising

a vacuum chamber,

a substrate holder for holding an at least substantially planar substrate at a situs in said chamber,

an electrode spaced opposite said situs, said electrode having an approximately cylindrical projecting rim at a common potential with said electrode and extending toward said substrate holder so that a gap is provided between said projection and the plane of said substrate, said electrode further having a diaphragm ring adjacent said gap and extending radially inward from said rim in a plane parallel to the plane of said substrate, a pot-shaped grounded shield at least partially enclosing said electrode and overlapping said rim,

an insulator ring of electrically insulating material supported by said grounded shield and extending radially inward from said grounded shield toward said situs at least substantially in the plane of said substrate, and

a radio frequency generator with an output frequency above 100 kHz, said generator having output electrodes respectively connected to said electrode and to said substrate holder, whereby the luminous discharge is limited to the space between the electrode and the substrate holder.

4,954,202

APPARATUS FOR MAKING V-GROOVE INSULATION

Donald Price; Frank Price, and Charles M. Nelson, all of Houston, Tex., assignors to Industrial Insulations of Texas, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 119,821, Nov. 12, 1987, Pat. No. 4,838,968. This application Jun. 12, 1989, Ser. No. 364,452

Int. Cl.[5] B32B *31/18*

U.S. Cl. 156—353 51 Claims

1. An apparatus for the fabrication of grooved lengths of insulation material from sectional lengths of such material, said apparatus comprising in combination:

a frame;

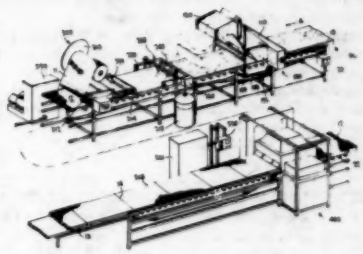
a conveyor system disposed along the frame and adapted to travel in a longitudinal direction;

feeding means situated at an upstream end of the conveyor system, and adapted to place sectional insulation lengths in an end-to-end, abutting relationship on the belt;

a planing means disposed above and secured to said frame downstream from said feeding means, said planing means adapted to establish a desired thickness in said lengths as the lengths move longitudinally along said frame;

a spraying system positioned along said frame above the belt, and adapted to apply an adhesive coating over the upper, exposed surface of said lengths of insulation material as they move downstream from said planing means;

a backing device situated downstream from said spraying system and in transversely movable relation to said frame, said backing device comprising a backing spool and a contact arm arranged to position backing from said spool onto the upper surface of said insulation sheet in such a manner that the combination backing material and abutting insulation sections form a continuous integral sheet;



a grooving means slidably disposed in a lateral direction relative to said frame and beneath the level of said belt, said grooving means constructed and arranged to form a series of lateral grooves or notches in the underside of said integral sheet as it progresses longitudinally down said frame and comprising

means for supporting said integral sheet during formation of said lateral grooves;

movable unitary support means capable of moving laterally beneath said support means for said integral sheet; and

a pair of saw assemblies adjustably mounted on said movable unitary support in an offset inclined relationship to each other; and

a microprocessor assembly adapted to control the movement of said insulation lengths through said apparatus.

4,954,203

LABELLING SYSTEM

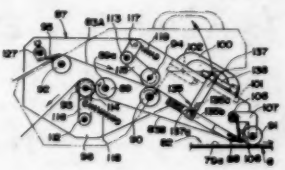
Mitsuo Matsumoto, Hyogo, Japan, assignor to Kanzaki Seishi Co., Ltd., Tokyo and Sun-Tec Co., Ltd., Hyogo, both of, Japan

Filed Dec. 5, 1988, Ser. No. 280,020

Claims priority, application Japan, Dec. 7, 1987, 62-186199[U]; Dec. 7, 1987, 62-186200[U]; Dec. 7, 1987, 62-186201[U]; Dec. 7, 1987, 62-186202[U]

Int. Cl.[5] B65C *1/00*

U.S. Cl. 156—361 8 Claims



1. A labelling system for applying adhesive labels to a series of post cards or the like including conveyor means for conveying cards or the like to be labelled one at a time along a label-

ling path, and a labelling mechanism positioned alongside said labelling path for successively applying labels to cards being advanced along said path, said labelling mechanism comprising

(a) web guide means for guiding a label carrier web toward a labelling position along said path,

(b) said web guide means including a guide roller and cooperating pressure member for retaining the passage of said carrier web,

(c) a knife member for sharply reversing the direction of travel of said carrier web at the labelling position,

(d) an exit drive roller and cooperating pressure member for pulling said carrier web on the exit side of said knife member,

(e) means mounting said labelling mechanism for swinging movement toward and away from said conveyor means about an axis remote from said knife member to allow said knife member to be retracted from said conveyor means for threading of a carrier web, and

(f) cam-like means co-acting with each of said pressure members and operative upon swinging of said labelling mechanism for retraction of said knife member to effect separation of said cooperating pressure members in order to free said carrier web for unimpeded movement through the mechanism for web threading operations.

4,954,204

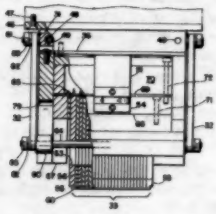
PRESSER MEMBER FOR CONTOURED SURFACES

Michael N. Grimshaw, Milford, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 25, 1988, Ser. No. 275,822

Int. Cl.[5] B32B *31/08*

U.S. Cl. 156—361 **5 Claims**



1. In a machine for applying fiber reinforced composite material to a work surface, wherein the machine has:

a base frame located in a predetermined position with respect to the surface;

a head, movably mounted on the base frame, for applying the material; and

means for controlling relative movement of the head with respect to the surface, along plural axes, while applying material,

an improved presser member for the head, wherein the improvement comprises:

a presser member housing, including means for affixing said housing to said head;

a plurality of wafer-like plates, having flat parallel opposite faces, stacked in adjacent face-to-face array in said housing,

said plates each having a common workpiece presser edge extending from said housing, and

said plates each also having a biasing portion extending into said housing;

means for independently guiding said plates in parallel movements with respect to said housing:

bladder spring means in said housing for yieldably biasing said plates away from said housing; and

power means for controlling common movement of said plates at predetermined times,

wherein as said workpiece presser edges are relatively run over material in contact with a work surface, said plates may slip parallel to one another to permit said presser edges to conform to workpiece contours.

4,954,205

JOINING DEVICE FOR CORD-REINFORCED BELT-SHAPED MATERIALS

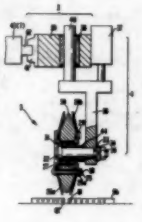
Jiro Agawa, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,841

Claims priority, application Japan, Jan. 7, 1988, 63-620

Int. Cl.[5] B29D *30/30*

U.S. Cl. 156—502 **1 Claim**



1. A joining device for joining ends of elastic belt-shaped material, said device comprising:

a wrapping drum; and

a splicer confronting said wrapping drum for joining spaced apart opposing ends of elastic belt-shaped material wrapped around said drum,

said splicer including a splicing roller rotatably supported in the device, said splicer roller having an outer circumferential contact surface and tapered in a radial direction extending from the center thereof toward said circumferential contact surface, spring discs fixedly secured to said roller at opposite sides of said roller, said spring discs having outer circumferential portions extending toward one another from respective central portions of the spring discs and terminating at outer peripheries of the spring discs located radially outwardly of said roller such that the spacing between said spring discs at the central portions thereof is greater than the spacing between said spring discs at the outer peripheries thereof, said spring discs having slits extending radially therein at said outer circumferential portions, and said spring discs exhibiting resiliency which allows said outer peripheries thereof to be resiliently bendable toward one another, press means connected to said roller for moving said roller and said spring discs fixedly secured thereto toward and away from said wrapping drum, and lateral moving means connected to said roller for moving said roller and said spring discs fixedly secured thereto axially of said drum.

4,954,206

WELDING APPARATUS FOR WELDING PLASTIC WEB INCLUDING TENSIONED STRIPS OF POLYTETRAFLUOROETHYLENE

Hans-Ludwig Voss, Tecklenburg, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Sep. 27, 1988, Ser. No. 249,687

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732639

Int. Cl.[5] B30B *15/04, 15/34*

U.S. Cl. 156—537 **5 Claims**

1. A welding apparatus for welding flat webs or web sec-

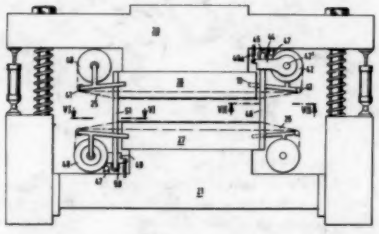
tions made of synthetic thermoplastics, said welding apparatus comprising

two parallel welding bars adapted to be raised and lowered relative to each other, each having a top welding surface and lateral side surfaces,

tensioned strips of polytetrafluoroethylene covering said welding bars and fixed on rolls disposed beyond opposite ends of each welding bar, said rolls serving to wind up and unwind said tensioned strips,

said tensioned polytetrafluoroethylene strips covering the top welding surfaces and at least part of one of said lateral side surfaces and extending in a longitudinal direction of said bars, said rolls being movably mounted beyond opposite ends of said welding bars on axles extending transversely to said longitudinal direction of said welding bars, and

guiding elements provided at least on one side of said lateral side surfaces of each welding bar and each of said elements together with one lateral side surface of the associated welding bar defining a passage for guiding an edge portion of said strips.



5. A welding apparatus for welding flat webs or web sections made of synthetic thermoplastics, said welding apparatus comprising

two parallel welding bars adapted to be raised and lowered relative to each other,

tensioned strips of polytetrafluoroethylene covering said welding bars and fixed on rolls disposed beyond opposite ends of each welding bar, said rolls serving to wind up and unwind said tensioned strips,

said tensioned strips covering the welding bars extend in a longitudinal direction of said bars,

the rolls being movably mounted beyond opposite ends of the welding bars on axles extending transversely to said longitudinal direction of said welding bars, and

one of the rolls withdraws the polytetrafluoroethylene strip and is mounted on its associated axle by a free-wheel and is provided with a lever, said lever being intermittently moved in small angular increments and is adapted to be reset, and

means for intermittently moving the lever in small angular increments by moving the welding jaws, and

spring means for resetting the levers.

4,954,207

APPARATUS FOR AUTOMATICALLY TAPING ELECTRONIC COMPONENTS

Hirokazu Higuchi, and Mitsuro Hamuro, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 1, 1989, Ser. No. 317,639

Claims priority, application Japan, Mar. 2, 1988, 63-50540

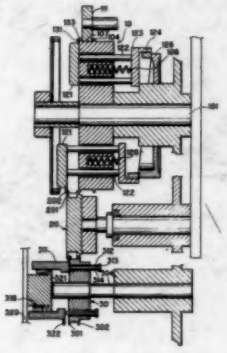
Int. Cl.[5] B65H *5/26*

U.S. Cl. 156—552 **17 Claims**

1. An apparatus for handling electronic components, said apparatus comprising:

(A) advancing means for advancing an elongated support member in a first direction, said elongated support member having a plurality of electronic components supported thereon;

(B) extracting means for automatically extracting said electronic components from said elongated support member in a second direction while said elongated support member is advancing in said first direction, said second direction being substantially perpendicular to said first direction; and



(C) means for placing said extracted electronic components between first and second opposed elongated tapes to fix said electronic components between said tapes;

wherein said advancing means includes a first rotatable drum;

wherein said extracting means includes: movable plates which are rotatable together with said drum; and means for moving said plates in said second direction while said plates rotate together with said drum.

4,954,208

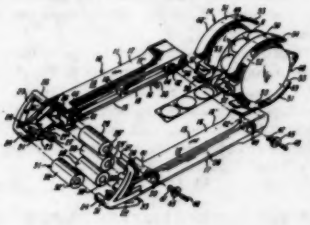
HAND-HELD LABELLER

Paul H. Hamisch, Jr., Franklin, and James A. Makley, Miamisburg, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 408,309, Aug. 16, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 643,745

Int. Cl.[5] B31F *1/00*

U.S. Cl. 156—577 **9 Claims**



1. A hand-held labeler for applying labels releasably adhered to a carrier web, the labeler comprising: a body, means mounted on the body for supporting a label supply roll, means mounted on the body for delaminating means for applying labels, means defining a feed path for the carrier web through the body, means for advancing the carrier web through the feed path to dispense a label into label applying relationship with respect to the label applying means, the label supporting

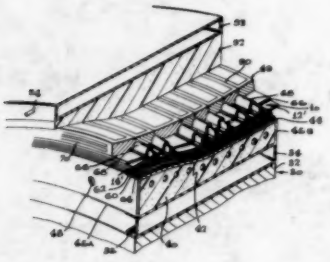
means including a pair of separate and identical, spaced apart wall members between which a label supply roll is adapted to be supported.

4,954,209

APPARATUS FOR PRODUCING MOLDED ARTICLES

Robert M. Baron, Los Angeles, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 12, 1988, Ser. No. 282,521
Int. Cl.[5] B30B *5/02*
U.S. Cl. 156—583.1 **11 Claims**



1. An apparatus for molding a part for having two opposed principle surfaces and made from layed-up molded materials, the apparatus comprising:

a support;

containment means moveable in relationship to said support;

a first mold part having a surface for forming one of the principle surfaces of the lay up, said first mold part attached to said support and mounted within said containment means;

a second mold part having a surface for forming the opposed principle surface of the lay up, said second mold part mounted within said containment means and movable in relationship to said first mold part;

at least one layer of expandable material mounted on each of said surface of said first and second mold parts, said layers of material expandable upon the application of heat thereto;

first and second inflatable container means made of a flexible material mounted between said containment means and said first and second mold parts for supporting said first and second mold parts, respectively;

means to heat said layers of expandable material and to raise the temperature of the lay up therebetween to forming temperatures; and

means to pressurize said first and second container means;

such that during the molding process said first mold part is held stationary and said expandable layers of material expand and compact the lay up and said container means supports the first and second mold parts and the reaction forces are absorbed by the containment means.

4,954,210

DISPENSER FOR ROLLED PRESSURE SENSITIVE LABELS

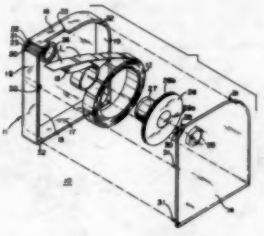
John W. Desmond, 104 Walter Dr., Media, Pa. 19063

Continuation-in-part of Ser. No. 334,078, Apr. 6, 1989, abandoned. This application Nov. 6, 1989, Ser. No. 432,059
Int. Cl.[5] B65C *11/00*
U.S. Cl. 156—584 **17 Claims**

1. A dispenser for dispensing labels from a label strip comprising a backing strip upon which the labels are mounted with a pressure-sensitive adhesive backing on the labels, the labels being adapted to be peeled away from the backing strip by sharply reversely bending the backing strip over an edge, the improvement comprising:

a housing for containing a supply roll of such a label strip, said housing having side walls, a top, a bottom and end walls, said housing being provided with an edge adjacent the junction of one of said end walls and the top thereof, together with an opening adjacent said junction, the strip being adapted to be withdrawn from said housing through said opening toward and over said edge to dispense a label;

a second opening in said housing adjacent to and spaced from said first named opening to permit the backing strip to reenter the housing after dispensing a label, said openings and said edge comprising a dispensing maze for the backing strip, said dispensing maze including two vertically spaced cantilevered fingers each supported by one of



said side walls, said cantilevered fingers being separated at their outer ends by an interlocking structure supported by the opposite one of said side walls,

bearing means carried by at least one of the side walls within said housing and spaced from the periphery of the roll of label strip;

a shaft carried by said bearing means within said housing, said shaft being adapted to have the backing strip wound thereon after the pressure-sensitive adhesive backed labels are peeled therefrom; and

a hand wheel fixed to one end of said shaft for rotating said shaft, said hand wheel being positioned within said housing between said side walls and partially extending through an opening in said housing for manual rotation to dispense labels from the backing strip and for storing the backing strip on said shaft within said housing as the strip is unwound from the roll.

4,954,211

MONOCRYSTALLINE LANTHANUM ORTHOGALLATE LASER MATERIAL

Roger F. Belt, Morristown, and Robert Uhrin, Brookside, both of N.J., assignors to Litton Systems, Inc., Morristown, N.J.

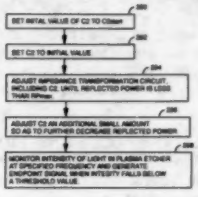
Filed Mar. 4, 1988, Ser. No. 164,110
Int. Cl.[5] C04B *35/48*; C01F *11/02*
U.S. Cl. 156—617.1 **71 Claims**

1. A laser rod composed of monocrystalline lanthanum orthogallate grown from a pure melt along a predetermined crystallographic direction and doped with an impurity ion that functions as a laser activator, said laser rod having a wavefront distortion $< \frac{1}{4}\lambda$ per cm length at the lasing wavelength (λ) and an optical loss <0.005 per cm length.

4,954,212
ENDPOINT DETECTION SYSTEM AND METHOD FOR PLASMA ETCHING

Calvin T. Gabriel, Pacifica, and James E. Nulty, San Jose, both of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 26, 1989, Ser. No. 412,697
Int. Cl.[5] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—627 **12 Claims**


SET INITIAL VALUE OF C2 TO C2max
SET C2 TO INITIAL VALUE
ADJUST IMPEDANCE TRANSFORMATION CIRCUIT, INCLUDING C2, UNTIL REFLECTED POWER IS LESS THAN RPmin
ADJUST C2 BY ADDITIONAL SMALL AMOUNT SO AS TO FURTHER DECREASE REFLECTED POWER
MONITOR INTENSITY OF LIGHT IN PLASMA ETCHER AT SPECIFIED FREQUENCY AND GENERATE ENDPOINT SIGNAL WHEN INTEGITY FALLS BELOW A THRESHOLD VALUE

7. A method of detecting the completion of etching of a designated layer of material in a plasma etching system, the steps of the method comprising:

placing a target having a designated layer to be etched and a underlying layer below said designated layer in a plasma etching chamber;

coupling a power supply means to said plasma etching chamber with an adjustable impedance circuit,

enabling said power supply to provide power to said plasma etching chamber;

monitoring the amount of power from said power supply means reflected by said plasma etching chamber;

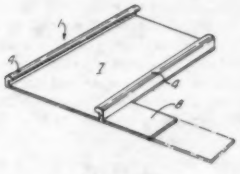
adjusting the impedance of said adjustable impedance circuit so that the amount of reflected power reflected by said plasma etching chamber will increase when said plasma etching chamber completes the etching of said designated layer and begins etching said underlying layer; and

detecting when said plasma etching chamber completes the etching of said designated layer and begins etching said underlying layer.

4,954,213
WRAP-AROUND RECOVERABLE SLEEVE

Doucet Jos, Kessel-Lo, and Mendes L. Neves, Begijnendijk, both of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 27, 1988, Ser. No. 263,571
Claims priority, application United Kingdom, Oct. 27, 1987, 8725146
Int. Cl.[5] H01B *13/06*
U.S. Cl. 156—49 **20 Claims**



1. A method of enclosing a splice between cables which comprises:

(1) wrapping around the splice a sleeve, said sleeve comprising:

a first web of dimensionally-recoverable material that can substantially surround the splice;

a first closure member at a first longitudinal edge portion of the first web;

a second closure member at a second longitudinal edge portion of the first web, the first and second closure members being capable of being held together to maintain the sleeve in a wrapped-around configuration around the splice; and

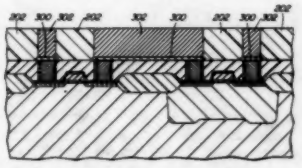
a second web of material that extends from the first closure member in a direction substantially perpendicular to the running length of that closure member, as determined when the closure member is in flat sheet form, and has a width extending along the running length of that closure member that is less than the length of the closure member, the sleeve being positioned such that the second web is positioned around one of the cables adjacent the splice; and

(2) causing dimensional-recovery of the first web.

4,954,214
METHOD FOR MAKING INTERCONNECT STRUCTURES FOR VLSI DEVICES

Vu Quoc Ho, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 5, 1989, Ser. No. 293,789
Int. Cl.[5] H01L *21/308, 21/283*
U.S. Cl. 156—628 **14 Claims**



1. A method for making interconnect structures for semiconductor devices, said devices initially being covered with a first substantially planar dielectric insulating layer having contact holes extending therethrough over contact regions of the devices, and said contact holes being filled with conductive material, the method comprising:

providing said devices initially being covered with a first substantially planar dielectric insulating layer;

forming a layer of seed material at and connected to an exposed surface of said first substantially planar dielectric insulating layer and at and connected to said filled contact holes at predetermined locations where interconnect conductor for interconnecting said semiconductor devices is desired;

forming a second substantially planar dielectric insulating layer over the first substantially planar dielectric insulating layer;

forming openings extending through the second layer at the predetermined locations to expose at least a portion of the seed material; and

selectively depositing conductive material on the exposed seed material to fill the openings while avoiding deposition of the conductive material on the second dielectric insulating layer adjacent to the seed material.

4,954,215

METHOD FOR MANUFACTURE STRESS DETECTOR

Hiroshi Satou; Yoshihiko Utsui; Kiyotugu Tuneyoshi; Takashi Taniguchi; Kousuke Haraga, and Keitarou Tsukui, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

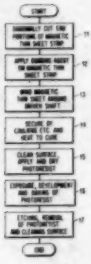
PCT No. PCT/JP88/00727, § 371 Date May 5, 1989, § 102(e) Date May 5, 1989, PCT Pub. No. WO89/00770, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 20, 1988, Ser. No. 346,112

Claims priority, application Japan, Jul. 21, 1987, 62-182712; Oct. 26, 1987, 62-271164; Oct. 26, 1987, 62-271165; Dec. 18, 1987, 62-322008

Int. Cl.[5] B44C *1/22*; B23K *9/00*; C23F *1/02*; C03C *15/00*

U.S. Cl. 156—630 10 Claims



1. A method for manufacturing a stress detector comprising the steps of securing a strip of magnetic thin sheet around the driven shaft receiving a stress, and applying a selective coating removal treatment to said magnetic thin sheet secured to said driven shaft to form magnetic elements parallelly arranged at a predetermined angle relative to the central axis of said driven shaft.

4,954,216

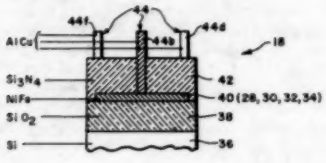
PROCESS OF MAKING THIN FILM VECTOR MAGNETOMETER

Paul Hunter, Burtonsville, and Leonard J. Schwee, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 623,893, Jun. 25, 1984, abandoned. This application Dec. 26, 1989, Ser. No. 456,231

Int. Cl.[5] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—634 16 Claims



1. A process of fabricating a thin film vector magnetometer, comprising the steps of:

(1) fabricating a magnetoresistive bridge including the steps of;

(1*a*) fashioning a suitable substrate for fabrication thereon;

(1*b*) depositing a magnetic material to a predetermined thickness onto said suitable substrate so as to form a predetermined number of magnetoresistors each having a predetermined geometric pattern of meandering resistor lines, the depositing of said magnetic material being accomplished in the environment of a dc magnetic field so as to produce a well defined easy axis therein;

(1*c*) depositing an insulating material over said magnetoresistors so as to create vias for making electrical connections thereto; and

(1*d*) depositing a conducting material within the insulating material to create electrical bonding pads to said magnetoresistors;

(2) affixing said magnetoresistive bridge to a chip carrier; and

(3) affixing a bias magnet to said chip carrier so as to produce a bias field in said magnetoresistors of said magnetoresistive bridge orthogonal to the easy axis thereof.

4,954,217

METHOD FOR MANUFACTURING LIQUID CRYSTAL DEVICE HAVING ELECTRODE STRIPS OF NO USE

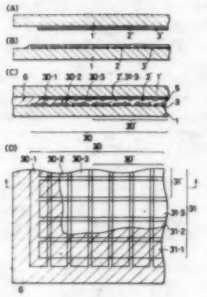
Shunpei Yamazaki, Tokyo; Akira Mase, Atsugi, and Hiroyuki Sakayori, Machida, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 82,544, Aug. 7, 1987, Pat. No. 4,854,675. This application Jul. 21, 1988, Ser. No. 222,634

Claims priority, application Japan, Aug. 8, 1986, 61-186201

Int. Cl.[5] B44C *1/22*; B32B *31/12*

U.S. Cl. 156—643 3 Claims



1. A method for manufacturing a liquid crystal device comprising the steps of:

forming on the surface of a transparent substrate a plurality of first electrode strips elongated along a X direction and separated with respect to each other;

forming on the surface of an opposed substrate a plurality of second electrode strips elongated along a Y direction and separated with respect to each other; and

joining said transparent and opposed substrates with said first and second electrode strips facing each other together with a liquid crystal layer inbetween while the perimeter of said substrates is sealed by a sealing member;

said method characterized in that said joining step is carried out in such a manner that the sealing member extends between the peripheral portions of said electrode strips.

4,954,218

METHOD FOR ETCHING A PATTERN

Katsuya Okumura; Tohru Watanabe, and Masami Watase, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 4, 1989, Ser. No. 389,681

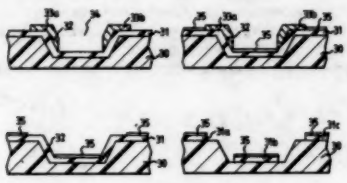
Claims priority, application Japan, Sep. 8, 1988, 63-233503

Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*

U.S. Cl. 156—643 7 Claims

1. A method for forming a prescribed pattern, comprising the steps of:

preparing a substrate having a first main surface configured with a recessed portion;
forming a first layer covering the first main surface including the recessed portion;
forming a second layer on the first layer;
selectively removing the second layer to form a first patterned layer;



immersing the substrate having the first patterned layer into a predetermined solution to form a third layer selectively on the exposed portions of the first layer;
removing the first patterned layer; and
etching the first layer using the third layer as a mask.

4,954,219

METHOD FOR TRANSFERE OF FIRROUS MATERIALS TRANSPORT BY LIQUIDS

Stig Glöersen, Karlstad, Sweden, assignor to Beloit Corporation, Beloit, Wis.

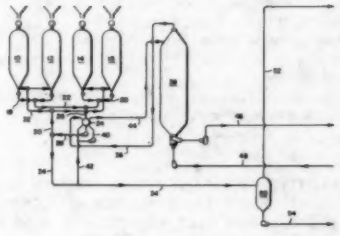
Continuation of Ser. No. 823,840, Jan. 31, 1986, abandoned, which is a continuation of Ser. No. 387,474, Jun. 11, 1982, abandoned, which is a continuation of Ser. No. 184,407, Nov. 2, 1979, abandoned. This application Aug. 18, 1988, Ser. No. 233,978

Claims priority, application Sweden, Mar. 2, 1978, 7802408

The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.

Int. Cl.[5] D21C *7/08, 7/14, 9/02, 11/00*

U.S. Cl. 162—41 **8 Claims**



4. A method for transporting and treating fiber material, which comprises:
introducing a fiber material and cooking liquor into a first liquid circuit from at least one discontinuous cooking digester;
transferring said fiber material via said at least one liquid circuit to a continuous washing station, said fiber material being displaced to said continuous washing station by providing a rotary valve in the first liquid circuit;
introducing fiber material and cooking liquor into the rotary valve;
displacing the cooking liquor with washing liquor from said washing station;
transporting the fiber material in a second liquid circuit to the washing station by introducing said displaced cooking liquor into the rotary valve to remove the fiber material.

4,954,220

POLYSILICATE MICROGELS AS RETENTION/DRAINAGE AIDS IN PAPERMAKING

John D. Rushmere, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1989, Ser. No. 388,967

Int. Cl.[5] D21H *21/10*

U.S. Cl. 162—168.3 **7 Claims**

1. A method for improving retention and drainage in a papermaking process of the type wherein aqueous paper furnish containing pulp is formed and dried which comprises adding to the pulp a water soluble polysilicate microgel formed by partial gelation of an alkali metal silicate in combination with at least about 0.001 wt percent, based on the dry weight of the paper furnish, of a water soluble cationic polymer.

4,954,221

APPARATUS FOR FEEDING LIGNOCELLULOSE-CONTAINING MATERIAL THROUGH A STEAM SCREEN INTO A REFINER

Rolf B. Reinhall; Johan G. I. Johansson, both of Bellevue, Wash., and Anders V. Mokvist, Eden Prairie, Minn., assignors to Sunds Defibrator Aktiebolag, Sundsvall, Sweden

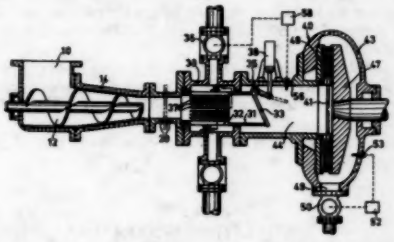
PCT No. PCT/SE84/00120, § 371 Date Nov. 19, 1984, § 102(e) Date Nov. 19, 1984, PCT Pub. No. WO84/04113, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 3, 1984, Ser. No. 681,847

Claims priority, application Sweden, Apr. 12, 1983, 8302014

Int. Cl.[5] D21B *1/26*

U.S. Cl. 162—261 **4 Claims**



1. An apparatus for making fibre pulp from lignocellulose-containing material, comprising a refiner provided with at least two opposed refiner discs, the refiner discs being rotatable relative to each other and defining a gap therebetween, a feed channel including a plug pipe of predetermined cross-sectional area and an inlet opening for feeding the material to the gap in a compressed state, wherein a steam screen pipe is positioned directly downstream from the plug pipe, the steam screen pipe being provided with apertures for discharging steam, the steam screen pipe having a cross-sectional area slightly greater than the predetermined cross-sectional area of the plug pipe, the apertures being provided as axially directed slits extending adjacent to a channel section having a cross-sectional area greater than the cross-sectional area of the steam screen pipe.

4,954,222

DRY CLEANING SOLVENT FILTRATION AND RECOVERY SYSTEM WITH FILTER RINSING APPARATUS

Larry L. Durr, 9102 Grinnell, Indianapolis, Ind. 46268; B. Jan Clay, 7650 Eagle Valley Pass, Indianapolis, Ind. 46224, and Larry J. Durr, 5210 Kathcart Way, Indianapolis, Ind. 46254

Filed Nov. 18, 1988, Ser. No. 273,261

Int. Cl.[5] B01D *3/38, 36/00*

U.S. Cl. 202—176 **13 Claims**

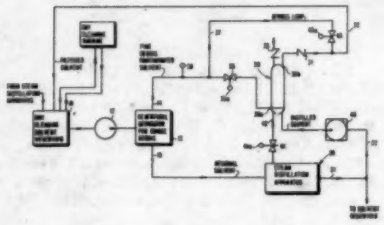
1. In an industrial solvent recovery and filtering system

having a supply of a debris contaminated solvent fluid, a distillation apparatus for producing a quantity of distilled solvent fluid, and a fluid flowpath between the supply and the distillation apparatus, the improvement comprising:

a filtration path receiving at an inlet the debris contaminated solvent fluid from the supply and discharging at an outlet a filtered solvent fluid, said filtration path including;

filtering means for removing the debris from the contaminated solvent fluid, said filtering means including a perforated filter element having a debris collection surface; and

means for flowing the contaminated solvent fluid through said filter element in a first direction so that the debris in



the solvent fluid is collected on said collection surface while the filtered solvent fluid passes through the perforations in said filter element; and

filter cleaning means, separate from said filtration path, for cleaning said filter element without removing said filter element from the filtration path, said filter cleaning means including;

a nozzle for directing a spray of rinsing under pressure against said collection surface of said filter element can be cleaned without backflow fluid pressure on said filter element; and

means for removing debris dislodged from said filtering means.

4,954,223

DISTILLATION APPARATUS

Joseph E. Leary, 10994 Terrace Dr., Forrestville, Calif. 95436, and Edward L. Parr, 301 Cuyamaca St., El Cajon, Calif. 92020

Filed Jul. 29, 1988, Ser. No. 225,736

Int. Cl.[5] B01D *1/28, 3/10*

U.S. Cl. 203—1 **7 Claims**

1. A distillation apparatus, comprising:

a pair of vertically arranged, side by side two-part vessels;

each two-part vessel comprising a lower vessel having an open upper end, and a vertically arranged, elongate upper vessel having an open lower end, and means for slidably mounting said upper vessel at its lower end in said lower vessel;

a first heat exchanger mounted in a first one of the upper vessels and having an inlet and an outlet;

a second heat exchanger mounted in a second one of the upper vessels and having an inlet and an outlet;

a first conduit connecting the upper end of the first upper vessel with the inlet of the second heat exchanger;

a second conduit connecting the upper end of the second upper vessel with the inlet of the first heat exchanger;

supply means connected to each of the two-part vessels for supplying a liquid to be distilled to the vessels;

outlet conduits connected to the outlets of both heat exchangers for conveying distillate out of the vessels;

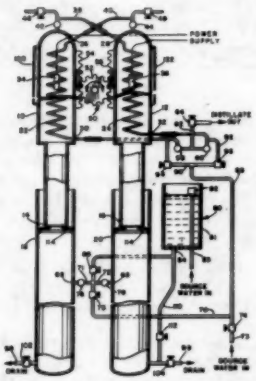
reciprocating drive means connected to the upper vessels for alternately driving the upper vessels up and down in opposite directions to simultaneously effect compression and heating of vapor in a space above a liquid level in the first one of the upper vessels and expansion and cooling of vapor in a space above a liquid level in the second one of the upper vessels; and

solid collection means at the lower end of each of the lower vessels for collecting solids separated out from the liquid in the vessels.

7. A method of distilling liquids, comprising the steps of:

supplying liquid to be distilled to a pair of two-part vessels so as to leave a space above the liquid level in each vessel, each two-part vessel comprising an upper, vertically extending elongate vessel having an open lower end and a lower vessel having an open upper end in which said upper vessel is slidably mounted;

reciprocating said upper vertically extending elongate ves-



sels up and down in opposite directions in said lower vessels;

compressing and heating vapor in each upper vessel during its downward stroke and expelling vapor from the upper end of the downwardly moving vessel;

collecting vapor expelled from the upper end of each upper vessel during its downward stroke and conducting the collected vapor into a heat exchanger located in the other, upwardly moving upper vessel;

condensing vapor in the heat exchanger;

conducting the condensed distillate to an outlet of said heat exchanger; and

draining collected solids from the lower end of each lower vessel and collecting the drained solids.

4,954,224

EXTRACTIVE DISTILLATION OF HYDROCARBON FEEDS EMPLOYING MIXED SOLVENT

Ronald E. Brown, 6419 Quail Ridge Rd., and Fu M. Lee, 645 Castle Dr., both of Bartlesville, Okla. 74006

Filed Sep. 8, 1989, Ser. No. 404,704

Int. Cl.[5] B01D *3/40*

U.S. Cl. 203—51 **27 Claims**

1. In a process for separating at least one cycloalkane containing 5–10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed consisting essentially of said at least one cycloalkane and said at least one alkane,

the improvement comprising the use of a solvent consisting essentially of a mixture of (a) at least one N-mercaptoalkyl-2-pyrrolidone, wherein the mercaptoalkyl group contains 1–5 carbon atoms, and (b1) at least one N-alkyl-2-pyrrolidone, wherein the alkyl group contains 1–3 carbon atoms;

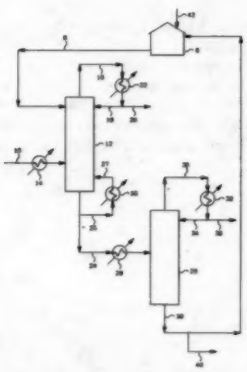
wherein said extractive distillation process produces (i) an overhead distillate product which contains a smaller volume percentage of said at least one cycloalkane and a

larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one cycloalkane and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one cycloalkane is separated from said solvent and recovered from said bottoms product.

23. In a process for separating at least one cycloalkane containing 5–10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed consisting essentially of said at least one cycloalkane and said at least one alkane,

the improvement comprising the use of a solvent consisting essentially of a mixture of

(a) at least one N-mercaptoalkyl-2-pyrrolidone, wherein the mercaptoalkyl group contains 1–5 carbon atoms,



(b1) at least one N-alkyl-2-pyrrolidone, wherein the alkyl group contains 1–3 carbon atoms, and

(b2) at least one saturated alcohol selected from the group consisting of alkanols and cycloalkanols containing 5–9 carbon atoms and 1 OH group per molecule;

wherein said extractive distillation process produces (i) an overhead distillate product which contains a smaller volume percentage of said at least one cycloalkane and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at least one cycloalkane and a smaller volume percentage of said at least one alkanes than said feed; and wherein said at least one cycloalkane is separated from said solvent and recovered from said bottoms product.

4,954,225
METHOD FOR MAKING NOZZLE PLATES

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jan. 10, 1990, Ser. No. 463,261
Int. Cl.[5] C25D *1/08*
U.S. Cl. 204—11 **9 Claims**

1. A method for fabricating a nozzle plate having a plurality of holes, comprising the steps of:

applying onto a transparent mandrel a coating of an opaque, conductive material having a pattern of holes of selected diameters and at selected locations corresponding to the diameters and locations of the holes of the nozzle plate;

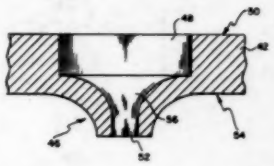
applying over said holes in said opaque, conductive coating, a non-conductive, transparent material to form a plurality of masked areas of selected dimensions, each area over one of said holes;

applying a layer of photoresist of selected thickness over said opaque, conductive coating and said non-conductive, transparent masked areas;

exposing said layer of photoresist from the backside of said transparent mandrel through said holes in said opaque, conductive coating and through said non-conductive, transparent masked areas to form on said masked areas a plurality of raised photoresist posts of selected dimensions, each post over one of said masked areas and in registration with said holes in said opaque, conductive material;

electroforming to a desired thickness a layer of a first metal onto said opaque, conductive coating until said layer of said first metal overgrows said masked areas by a selected amount;

electroforming to a desired thickness a first layer of a second metal over said layer of said first metal until said first layer of said second metal plates around said photoresist posts a desired amount, and wherein depressions are formed in said first and second metal layers in registration with said masked areas and said photoresist posts;



filling said depressions with a planarizing material to form a plurality of filled depressions;

applying a layer of photoresist of a selected thickness onto said first layer of said second metal and said filled depressions;

exposing said layer of photoresist to form a plurality of cured photoresist discs of select dimensions, eacn disc in registration with one of said filled depressions;

electroforming to a desired thickness a second layer of said second metal onto said first layer of said second metal;

separating said layers of said first and second metals, said non-conductive, transparent masked areas and said opaque, conductive coating from said transparent mandrel; and

removing said layer of said first metal, said non-conductive, transparent masked areas and said opaque, conductive coating from said first and second layers of said second metal.

4,954,226
ADDITIVE PLATING BATH AND PROCESS

Issa S. Mahmoud, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 289,995, Dec. 21, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 427,922
Int. Cl.[5] C25D *3/38, 7/00*
U.S. Cl. 204—15 **10 Claims**

1. An additive copper plating bath for plating copper for printed circuitry consisting essentially of:

an aqueous solution of from about 0.50 to about 0.75 mols sulfuric acid; from about 0.3 to about 0.50 mols copper sulfate; from about 1 to about 2 g/l urea, from about 2 to about 3 ml/l glycerin; and from about 0.5 to about 1.0 ml/l surface active agent and sufficient deionized water to make one liter.

7. A method of electroplating thick film circuitry on substrates with copper comprising:

preparing an aqueous bath including

0.50 to 0.75 mols sulfuric acid,

0.30 to 0.50 mols hydrated copper sulfate,

0.05 to 0.10 mols urea,
0.02 to 0.03 mols glycerin,
1% by volume, surfactant; and
electrodepositing a layer of copper on said thick film circuitry from the bath at a current density of between 15 and 25 amperes per square foot and at a bath temperature substantially equal to room temperature.

4,954,227

PREPARATION OF BIDENTATE LIGANDS

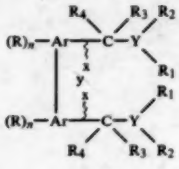
Thomas A. Puckette, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 118,573, Nov. 9, 1987, Pat. No. 4,879,008. This application Jul. 24, 1989, Ser. No. 383,697

Int. Cl.[5] C25C *3/00*

U.S. Cl. 204—72 **11 Claims**

1. A process for preparing a bidentate ligand of the formula:



wherein:

each Ar is independently selected from aromatic ring compounds having 6 up to 14 carbon atoms;

the x bonds and the y bonds are attached to adjacent carbon atoms on the ring structures;

each R, when present as a substituent, is independently selected from alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl, cyano or formyl radicals;

n is a whole number in the range of 0–4 where Ar is phenyl; 0–6 where Ar is naphthyl; and 0–8 where Ar is phenanthryl or anthracenyl;

each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl, alkaryl or cycloaliphatic radicals, or substituted derivatives thereof, wherein the substituted derivatives are selected from ethers, amines, amides, sulfonic acids, esters, hydroxyl groups or alkoxy groups;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

each of the above alkyl groups or moieties is a straight or branched chain of 1–20 carbons;

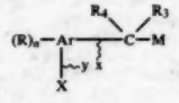
each aryl group contains 6–10 ring carbons;

each cycloaliphatic group contains from 4–8 ring carbons; and

each Y is independently selected from the elements N, P, As, Sb and Bi;

said process comprising:

(i) contacting a reagent having the structure:



wherein X is a halogen;

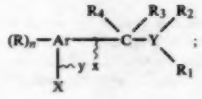
M is selected from the group consisting of Li, MgX, Na, K, Cd, Zn and Ca; and

the x bonds and the y bonds are attached to adjacent carbon atoms on the ring structures;

with a compound of the formula:

wherein X′ is halogen or a suitable leaving group

under conditions suitable to form a reactant of the formula:



then

(ii) maintaining a redox reaction system comprising

(a) said reactant,

(b) a polar, aprotic solvent,

(c) a nickel compound, and

(d) a reducing agent, which has a sufficient reducing potential to promote the reduction of Ni(II) to Ni(O), at a temperature and for a time sufficient to form said ligand.

4,954,228

DRUM ELECTROLYSIS

Thomas Thomassen, Brekkesto, Norway, assignor to Cheminuest, A.S., Norway

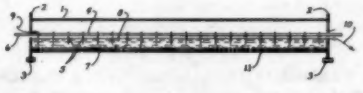
PCT No. PCT/NO88/00002, § 371 Date Dec. 19, 1988, § 102(e) Date Dec. 19, 1988, PCT Pub. No. WO88/09399, PCT Pub. Date Dec. 1, 1999

PCT Filed Jan. 8, 1988, Ser. No. 294,145

Claims priority, application Norway, Jun. 5, 1987, 872243; Jun. 5, 1987, 872388

Int. Cl.[5] C25C *1/00*

U.S. Cl. 204—105 R **5 Claims**



1. Process for electrowinning using a rotating drum cathode and at least one anode arrangement postioned inside the drum cathode into which is introduced and submerged a particulated material in an electrolyte containing the desired metal, and onto which particulated cathode material the desired metal is deposited when applying a suitable voltage over the cathode/anode arrangement, characterized in that the electrolyte is continuously introduced at one end of the drum and that the electrolyte, partly depleted of the desired metal(s), is exhausted at the opposite end, and that the the anode arrangement comprises a number of baffle plates disposed at intervals along the length of the drum and thus providing a tortuous path for the electrolyte.

4,954,229

BIOELECTROCHEMICAL DESULFURIZATION OF PETROLEUM

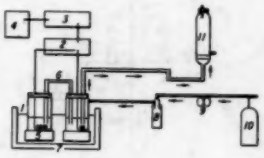
Byung-Hong Kim; Tae-Sung Kim, and Hae-Yeong Kim, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Dec. 20, 1988, Ser. No. 286,811

Claims priority, application Rep. of Korea, Dec. 31, 1987, 1987-15573

Int. Cl.[5] C25F 5/00

U.S. Cl. 204—130 10 Claims



1. A method for removing sulfur from a sulfur containing fuel by reducing the sulfur compound to gaseous hydrogen sulfide, which comprises subjecting the fuel to a bioelectrochemical process, comprising contacting said sulfur containing fuel with an aqueous phase containing and electron mediator and bacterium having the ability to catalyze the reduction of a sulfur compound in a cathode compartment of an electrolytic cell, providing an anode counterelectrode in said cell, imposing an electric current on said cell sufficient to cause said sulfur to form hydrogen sulfide, and removing said hydrogen sulfide.

4,954,230

DECONTAMINATION OF WASTE WATER

Rudolf Kirch, Immenstaad, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 160,324

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3705956

Int. Cl.[5] C02F 1/46

U.S. Cl. 204—149 7 Claims

1. Method for removing heavy metal in particular cadmium, nickel, copper, tin and zinc and oxidizable contaminants in particular tensides, cyanides, and nitrides from waste water in a combined cathodic/anodic process comprising the steps of; electrolytically treating said waste water to obtain metallic precipitation of the heavy metal on a cathode while simultaneously other contaminants are anodic oxidized;

using an anode being lead oxide coated Ti or graphite and a cathode made of stainless steel; and

passing the partially decontaminated electrolyte of the electrolytic treatment through an adsorber for further removal of said contaminants.

4,954,231

FUNCTIONAL CHLOROFLUORO COMPOUNDS AND THEIR PREPARATION

Yves Correia, Chateau-Arnoux; Gilles Drivon, Saint-Martien en Haut, and Jean Lesparre, Volonne, all of France, assignors to Societe Atochem, Puteaux, France

Filed Dec. 19, 1989, Ser. No. 452,339

Claims priority, application France, Dec. 27, 1988, 88 17241

Int. Cl.[5] C07C 69/00

U.S. Cl. 204—157.6 11 Claims

1. Functional chlorofluoro compound, comprising the general formula:

$$R_F{-}CCl_2{-}(CCl_2{-}O)_n{-}\overset{O}{\overset{\|}{C}}(X)_nY_{1-n} \quad (I)$$

in which R_F denotes a perfluoroalkyl radical, n is equal to 0 or 1, X denotes a chlorine or fluorine atom or a trichloromethyl or trifluoromethyl radical, and Y denotes a chlorine atom, an optionally salified or esterified hydroxyl group or an optionally mono- or di-substituted amino group, the arrangement $R_F{-}CCl_2{-}(CCl_2{-}O)_n$ containing at least 3 carbon atoms.

4,954,232

MAGNETO-OPTICAL RECORDING ELEMENT AND METHOD FOR FABRICATION THEREOF

Takashi Yamada, Kagoshima; Hisao Arimune, and Takashi Maeda, both of Kokubu, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

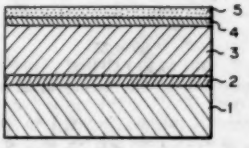
Continuation of Ser. No. 42,273, Apr. 24, 1987, Pat. No. 4,851,096, which is a division of Ser. No. 752,927, Jul. 8, 1985, Pat. No. 4,680,742. This application May 26, 1989, Ser. No. 358,554

Claims priority, application Japan, Jul. 7, 1984, 59-143079; May 30, 1985, 60-119342

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] C23C 14/14

U.S. Cl. 204—192.23 12 Claims



1. A method for the fabrication of a magneto-optical recording element, which comprises maintaining a substrate on which a film is to be formed, a first target composed of a sintered composition comprising (a) silicon nitride and (b) at least one additive selected from the group consisting of single elements, oxides, nitrides, sulfides and silicides of elements of the groups IIIa, IVa, IIb, IIIb, IVb and VIb of the Periodic Table and a second target composed of a magnetic layer-forming metal in an inert gas atmosphere maintained at 1×10^{-3} to 50×10^{-3} Torr and forming a magnetic layer and a dielectric layer alternately on the substrate by sputtering, wherein said additive (b) is contained in the first target in an amount of 4 to 20 mole %.

4,954,233

COMBINATION ANODE MOUNT AND HOT WATER OUTLET UTILIZING A CAM LOCK

Timothy H. Houle, Wauwatosa, and Robert M. Schurter, Elm Grove, both of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

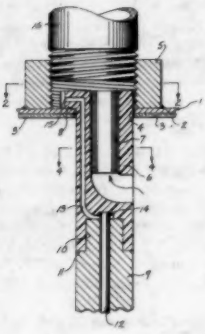
Filed Aug. 7, 1989, Ser. No. 390,971

Int. Cl.[5] C23F 13/00

U.S. Cl. 204—197 18 Claims

1. In a water heater, a tank to contain water to be heated and having an upper head with an opening therein, an annular metal spud secured to the upper head and having an aperture communicating with said opening, a body formed of an electrically insulating material, said body extending through said opening and having an upper end disposed within the aperture of said spud, passage means in said body with one end of said passage means extending through the side of said body and communicating with said tank and the other end of said passage means extending to the upper end of said body whereby heated water in the tank can flow through said passage means

for discharge, an anode formed of a metal electro-negative to steel and secured to the lower end of said body, electrical connecting means connected to said anode and having an upper end disposed at the upper end of said body, and laterally extending cam means on the upper end of said body, said cam



means being constructed and arranged so that rotation of said body relative to said spud will wedge said cam means into engagement with said spud and effect a positive electrical connection between the upper end of said electrical connecting means and said spud.

4,954,234

DRUM ELECTROLYSIS

Thomas Thomassen, Brekkesto, Norway, assignor to Cheminvest A.S., Norway

Division of Ser. No. 294,145, Dec. 19, 1988. This application Nov. 16, 1989, Ser. No. 437,546

Int. Cl.[5] C25C *7/00*

U.S. Cl. 204—212 **6 Claims**

1. Device for performing an electrowinning process comprising a rotatable drum cathode (1) being connected to a current scource, characterized in a device having supply and exhaust conduites (9,10) for introducing fresh electrolyte and removing lean electrolyte, and an anode arrangement (4,5) positioned inside the cathode drum (1), the drum having end walls (2) electrically isolated from the rest of the drum (1) and the anode arrangement having anode baffle plates (5) disposed at intervals along the length of the drum (1).

4,954,235

ELECTROPLATING OF FINE PARTICLES WITH METAL

Eiki Takeshima; Kiyoshi Takatsu, both of Chiba; Youichi Kojima, Hyogo, and Takahiro Fujii, Chiba, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

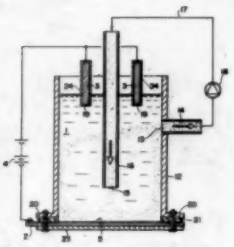
Division of Ser. No. 340,670, Apr. 20, 1989, Pat. No. 4,908,106. This application Dec. 27, 1989, Ser. No. 457,955

Claims priority, application Japan, Apr. 25, 1988, 63-100204

Int. Cl.[5] C25D *17/00*

U.S. Cl. 204—273 **2 Claims**

1. An apparatus for electroplating fine particles which comprises a tubular vessel containing an electroplating electrolyte disposed with its axis vertical, a cathode plate disposed at the bottom of said vessel with its electrically conductive surface horizontal, an anode disposed nearly at a level of said electrolyte, an electric source for applying a predetermined electric potential between said cathode plate and anode, an inhaling pipe having an opening for inhaling the electrolyte from said vessel at a level between said cathode plate and said anode, an exhaling pipe having an opening for exhaling the electrolyte into said vessel at a level between said cathode plate and said anode, a passage communicating said inhaling pipe with said exhaling pipe for circulation of said electrolyte therethrough,



and a pump for the circulation of said electrolyte installed in said passage, wherein said opening for exhaling the electrolyte is disposed so that it opens downwardly towards the electrically conductive surface of said cathode plate while the opening for inhaling the electrolyte is disposed at a level below the lower end of said anode, whereby fine particles to be plated having a particle diameter of from 0.1 to 10.0 μm suspended in said electrolyte may be repeatedly circulated through said passage and repeatedly brought in collision with the electrically conductive surface of said cathode plate.

4,954,236

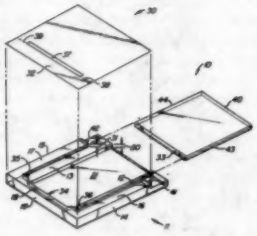
APPARATUS AND METHOD FOR GEL CASTING AND ELECTROPHORESIS IN A SINGLE ENCLOSURE

Gregory Kushner, Richmond, and Timothy E. Deloay, Hercules, both of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Jun. 28, 1989, Ser. No. 373,118

Int. Cl.[5] G01N *27/28, 27/26;* **B61D** *57/02*

U.S. Cl. 204—299 R **15 Claims**



1. An electrophoresis gel enclosure for use in both gel casting and electrophoresis, comprising:

a first plate rectangular in shape:

a second plate rectangular in shape, having shoulders along first and second opposing sides thereof and raised edges along said shoulders and a third side thereof, respectively, said raised edges arranged to receive said first plate therebetween with said first plate resting against said shoulders, said first and second plates thereby combinable to define a rectangular slab-shaped chamber of thickness defined by said shoulders; and

a fluid-impermeable sealing sheet sized to cover said first and second plates when so combined, adhering to said raised edges and said first plate, thereby sealing said rectangular slab-shaped chamber against leakage between said first plate and said raised edges, one edge of said fluid-impermeable sealing sheet along said third side of said second plate being removable.

4,954,237

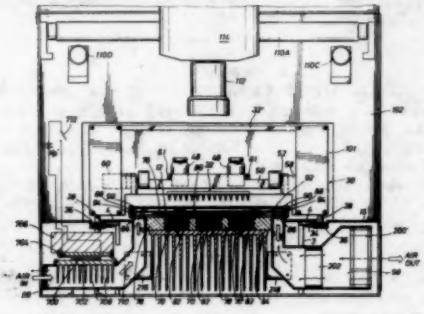
AUTOMATIC ELECTROPHORESIS APPARATUS

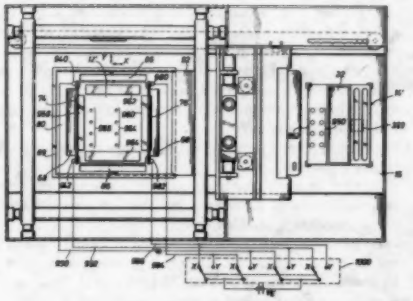
Robert J. Sarrine, Beaumont; Henry A. Garsee, Kountz; Charles D. Kelley, Beaumont, and Philip A. Guadagno, Vidor, all of Tex., assignors to Helena Laboratories, Beaumont, Tex.

Continuation-in-part of Ser. No. 26,465, Mar. 16, 1987, Pat. No. 4,810,348. This application Jan. 30, 1989, Ser. No. 302,936

Int. Cl.[5] G01N *27/28, 27/26;* **B01D** *57/02*

U.S. Cl. 204—299 R **7 Claims**





1. Electrophoresis apparatus comprising

a base,

an application plate longitudinally disposed on said base,

an electrophoresis support medium removably disposed on said application plate having longitudinal and lateral dimensions, said support medium including an electrically non-conductive backing having electrophoresis media placed thereon including an application well on its surface and having first and second electrically conductive reservoir strips disposed laterally at each of the longitudinal ends of said support medium,

first and second electrodes adapted for connection to opposite polarities of a source of electric potential and adapted for lateral placement across said support medium respectively in electrical contact with said first reservoir strip and with said second reservoir strip,

means for applying a liquid sample to said application well of said support medium,

means for connecting said electrical potential source between said first and second electrodes whereby electrophoresis electrical current is passed longitudinally through said support medium substantially uniformly across its lateral extent, and

heat transfer means for removing heat resulting from said electrophoresis electrical current in said support medium.

5. Electrophoresis apparatus comprising

a base,

an application plate longitudinally disposed on said base,

an electrophoresis support medium removably disposed on said application plate having longitudinal and lateral dimensions, said support medium including an electrically non-conductive backing having electrophoresis media placed thereon and having

first and second electrically conducting reservoir strips disposed laterally at each of the longitudinal ends of the support medium,

third and fourth electrically conducting reservoir strips disposed longitudinally at each of the lateral ends of the support medium,

said electrophoresis media being of substantially uniform thickness forming a planar surface atop said backing, and

electrode means for applying longitudinal electrophoresis current through said support medium between said first and second reservoir strips during one time period and for applying lateral electrophoresis current through said support medium between said third and fourth reservoir strips during another time period.

4,954,238

MOISTURE-SENSING HYGROMETER ELEMENT

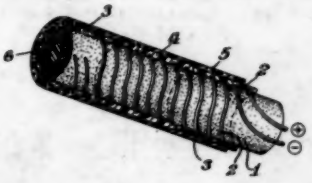
Hiroshi Kato, 123, Minamigata, Yoshinaga-cho, Wake-gun, and Eiichi Torikai, 9-20, 3-chome, Higashikyuhoji, Yao-Shi, Osaka-Fu, both of Japan

Filed Feb. 23, 1989, Ser. No. 314,642

Claims priority, application Japan, Feb. 23, 1988, 63-38528

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—430 **3 Claims**



1. A moisture-sensing hygrometric element comprising an electrolytic moisture-sensing mechanism integrally formed on the surface of a porous substrate, said porous substrate being resistant to oxidation and reduction and resistant to acids, and wherein said moisture-sensing mechanism comprises a pair of platinum group metal electrodes constituting an anode and a cathode and having a fluororesin cation exchange resin membrane layer thereover, wherein said porous substrate is porous expanded polytetrafluoroethylene.

4,954,239

PREFILLED CATHETER TIP SYRINGE KIT

Louis H. Mueller, 2836 Fox Squirrel Dr., Palm Harbor, Fla. 34684

Continuation-in-part of Ser. No. 182,259, Apr. 15, 1988, Pat. No. 4,878,903. This application May 31, 1989, Ser. No. 359,135

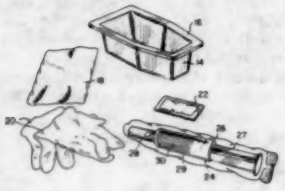
Int. Cl.[5] B65D *83/10*

U.S. Cl. 206—571 **4 Claims**

1. A device for use as a single use, disposable, sterile irrigation kit for catheter irrigation, comprising:

a prefilled sterile piston syringe containing from about 45 to

about 75 cc of a fluid selected from sterile water, saline solution and dilute aqueous acetic acid solutions, said syringe including a catheter tip sized to operably connect to a conventional catheter tube, a cap on said tip removably mounted to selectively prevent escape of said fluid from said syringe and prevent movement of said piston while said cap is on said tip, said kit further including a disposable pouch for enclosing said filled syringe, said



pouch and said filled syringe being sterilize after enclosure of said syringe in said pouch, said device further including a container having a tear-off top labeled with the specific solution in said syringe and a color code system marking at least a portion of said device with a color identifying the particular solution, said container enclosing said pouch containing said filled syringe and further including sterilized gloves and an applicator pad.

4,954,240

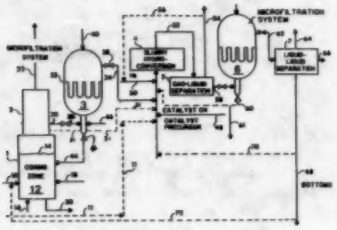
COMBINATION COKING AND HYDROCONVERSION PROCESS

Clarence M. Eidt, Jr., Chatham, N.J.; Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 97,121, Sep. 16, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 286,100

Int. Cl.[5] C10G *69/06*

U.S. Cl. 208—50 **17 Claims**



1. An integrated coking and hydroconversion process which comprises the steps of:

(a) treating a hydrocarbonaceous feed having a Conradson carbon content of at least 5 weight percent in a coking zone at coking conditions, including a pressure ranging from zero to about 100 psig, to produce coke and a vapor phase product, including hydrocarbonaceous comprising constituents boiling above 975° F.;

(b) separating a heavy bottoms fraction having a Conradson carbon content of at least about 5 weight percent, including said constituents boiling above 975° F., from said hydrocarbonaceous material;

(c) adding a hydroconversion catalyst or hydroconversion catalyst precursor to at least a portion of said heavy bottoms fraction to form a mixture;

(d) subjecting at least a portion of said mixture of step (c) to hydroconversion conditions, in the presence of hydrogen, in a slurry hydroconversion zone to produce a lower boiling hydroconverted product containing entrained catalyst particles;

(e) passing at least a portion of the lower boiling hydrocarbonaceous product through a microfiltration system containing a sintered porous ceramic or metal membrane filtering means having a substantially uniform pore size and capable of retaining at least about 95 percent of the entrained particles while maintaining an effective flux, thereby resulting in a solids-free fraction and a hydrocarbonaceous filtrate;

(f) subjecting at least a portion of the hydrocarbonaceous filtrate to a liquid-liquid separation, resulting in a light and intermediate boiling fraction and a heavy fraction; and

(g) recycling at least a portion of the heavy fraction to the coking zone.

4,954,241

TWO STAGE HYDROCARBON CONVERSION PROCESS

Simon G. Kukes, Naperville, Ill.; Albert L. Hensley, Jr., Munster, Ind.; Jeffrey C. Kelterborn, Hinsdale, and James L. Aderhold, Jr., Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 160,683, Feb. 26, 1988, Pat. No. 4,797,195. This application Dec. 20, 1988, Ser. No. 287,398

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[5] C10G *65/12*

U.S. Cl. 208—59 **6 Claims**

1. A multiple stage process for hydroconversion of a hydrocarbon feedstock containing nitrogen- and sulfur-containing compounds which comprises:

(a) contacting said feedstock in a hydrotreating stage comprising a hydrotreating reaction zone wherein hydrogen is contacted with said hydrocarbon feedstock in the presence of a hydrotreating catalyst at hydro-treating conditions wherein a substantial portion of the nitrogen- and sulfur-containing compounds are converted to hydrogen sulfide and ammonia;

(b) passing at least a portion of the effluent from said hydrotreating reaction zone to a stripping zone wherein a substantial portion of the hydrogen sulfide and ammonia is removed from the hydrotreating reaction zone effluent to form a stripping zone effluent;

(c) contacting at least a portion of said stripping zone effluent in a hydrocracking stage, comprising a plurality of hydrocracking reaction zones in series, with hydrogen at hydrocracking conversion conditions which comprises:

(i) contacting said stripping zone effluent in a first hydrocracking reaction zone with a first hydrocracking reaction zone catalyst comprising a nickel component and a molybdenum component deposed on a support component consisting essentially of a refractory inorganic oxide;

(ii) contacting the effluent from said first hydrocracking reaction zone in a second hydrocracking reaction zone with a second hydrocracking reaction zone catalyst comprising a nickel component and a tungsten component deposed on a support component consisting essentially of an alumina component and a crystalline molecular sieve component; and

(iii) contacting the effluent from said second hydrocracking reaction zone in a third hydrocracking reaction zone with a third hydrocracking reaction zone catalyst comprising a cobalt component and a molybdenum component deposed on a support component comprising a silica-alumina component and a crystalline molecular sieve component.

4,954,242

PROCESS FOR REFRACTORY COMPOUND REMOVAL IN A HYDROCRACKER RECYCLE LIQUID

Adrian J. Gruia, Lake Bluff, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jul. 19, 1989, Ser. No. 381,903
Int. Cl.[5] C10G 67/06, 25/03
U.S. Cl. 208—99 12 Claims

1. A catalytic hydrocracking process which comprises:

(a) contacting a hydrocarbonaceous feedstock having a propensity to form 11+ ring heavy polynuclear aromatic compounds and a liquid recycle stream in a hydrocracking zone with added hydrogen and a metal promoted hydrocracking catalyst at elevated temperature and pressure sufficient to convert a substantial portion of said feedstock to lower boiling hydrocarbon products;

(b) partially condensing the hydrocarbon effluent from said hydrocracking zone to produce a gaseous hydrocarbon stream comprising hydrogen, and an unconverted hydrocarbon stream having components boiling above about 400° F. and comprising trace quantities of 11+ ring heavy polynuclear aromatic compounds;

(c) partially condensing at least a portion of said gaseous hydrocarbon stream comprising hydrogen recovered in step (b) to produce a hydrogen-rich gaseous stream and a liquid stream comprising lower boiling hydrocarbon products;

(d) contacting at least a portion of said unconverted hydrocarbon stream having components boiling above about 400° F. and comprising trace quantities of 11+ ring heavy polynuclear aromatic compounds recovered in step (b) with an adsorbent in an adsorption zone which selectively retains said 11+ ring heavy polynuclear aromatic compounds to produce an unconverted hydrocarbon stream having components boiling above about 400° F. and having a reduced concentration of 11+ ring heavy polynuclear aromatic compounds;

(e) introducing at least a portion of said unconverted hydrocarbon stream having components boiling above about 400° F. and having a reduced concentration of 11+ ring heavy polynuclear aromatic compounds resulting from step (d) and said liquid stream recovered from step (c) into a separation zone to produce a stream of lower boiling hydrocarbon products and a stream of unconverted hydrocarbonaceous compounds boiling above about 400° F.; and

(f) recycling at least a portion of said stream of unconverted hydrocarbonaceous compounds boiling above about 400° F. recovered in step (e) and at least a portion of said unconverted hydrocarbon stream having components boiling above about 400° F. and having a reduced concentration of 11+ ring heavy polynuclear aromatic compounds resulting from step (d) to said hydrocracking zone as at least a portion of said liquid recycle stream.

4,954,243

CATALYTIC CRACKING WITH FRAMEWORK ALUMINUM EXTRACTED ZEOLITE

Guenter H. Kuehl, Cherry Hill, and Edward J. Rosinski, Pedricktown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 313,370, Feb. 21, 1989, abandoned, which is a continuation of Ser. No. 218,412, Jul. 11, 1988, abandoned, which is a continuation of Ser. No. 548,590, Nov. 3, 1983, abandoned. This application Dec. 22, 1989, Ser. No. 456,037
Int. Cl.[5] C10G 11/02
U.S. Cl. 208—120 11 Claims

5. A process for converting a feedstock comprising hydrocarbon compounds to conversion product comprising hydrocarbon compounds of lower molecular weight than feedstock hydrocarbon compounds which comprises contacting said feedstock at conditions sufficient to convert said feedstock to said product with a catalyst composition comprising a zeolite selected from the group consisting of ZSM-5 and ZSM-12 in the acid form, said zeolite having framework aluminum whereby the zeolite framework silica:alumina mole ratio is greater than about 12, wherein said zeolite has been treated to increase its acid activity by a treatment consisting of subjecting the zeolite with a silica:alumina ratio of greater than 12 to an aluminum extraction reagent selected from the group consisting of sulfuric acid and ethylenediaminetetraacetic acid at a temperature of 50° to 300° C. at a pressure sufficient to maintain a liquid phase to increase the acid activity of said zeolite, wherein at least about 5% of said framework aluminum is extracted; and producing said conversion product.

4,954,244

TREATMENT OF SPENT CRACKING CATALYSTS

Chia-Min Fu, and Michael K. Maholland, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1989, Ser. No. 370,471
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] C10G 11/05; B01J 38/66, 29/38
U.S. Cl. 208—120 41 Claims

1. A process for reactivating a spent zeolite-containing cracking catalyst composition comprising the steps of:

(a) contacting a spent zeolite-containing catalytic cracking catalyst composition, which contains at least one metal contaminant, with a solution of an ammonium compound other than ammonium fluoride, under such conditions as to enhance the catalytic cracking activity of said catalyst composition;

(b) at least partially separating the catalyst composition having enhanced catalytic cracking activity obtained in step (a) from said solution used in step (a);

(c) contacting the at least partially separated cracking catalyst composition having undergone steps (a) and (b) with at least one fluorine compound selected from the group consisting of NH_4F, NH_4HF_2 and HF, under such conditions as to enhance the catalytic cracking activity of the catalyst composition having undergone steps (a) and (b); and

(d) treating the reactivated catalyst composition obtained in step (c) with at least one metals passivating agent selected from the group consisting of compounds of beryllium, magnesium, calcium, strontium, barium, boron, aluminum, antimony, and phosphorus, under such conditions as to reduce hydrogen generation caused by said at least one metal contaminant during catalytic cracking.

4,954,245

CATALYST AND PROCESS FOR HIGH SELECTIVITY REFORMING WITH PT/RE ON BA-K-L ZEOLITE

Jeffrey T. Miller, and Victor K. Shum, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 20, 1988, Ser. No. 287,397
Int. Cl.[5] C10G 35/085
U.S. Cl. 208—138 13 Claims

1. A reforming process comprising contacting a hydrocarbon feedstock at reforming conditions with a catalyst comprising a Zeolite L component having cationic sites ion exchanged with at least one member of the group consisting of potassium and barium; a Group VIII noble metal component; and a rhenium component; where the catalyst, prior to contacting with the feedstock, is precluded from contact with sulfur in a presulfiding pretreatment step and the catalyst has been calcined at temperatures less than 550° F.

4,954,246

SLURRY-PHASE GASIFICATION OF CARBONACEOUS MATERIALS USING ULTRASOUND IN AN AQUEOUS MEDIA

Dharamvir Punwani, Naperville, and Michael C. Mensinger, Darien, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Mar. 31, 1988, Ser. No. 175,869
Int. Cl.[5] C10G 1/00
U.S. Cl. 208—402 20 Claims

1. A process for slurry-phase gasification of carbonaceous materials comprising:

combining solid carbonaceous feedstock materials with a slurry liquid to form a feedstock slurry;

conveying said feedstock slurry to a gasifier reaction vessel;

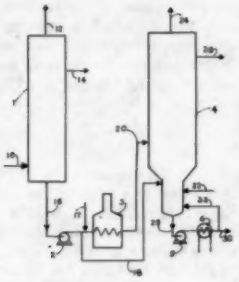
gasifying said carbonaceous feedstock in said gasifier vessel in slurry phase at reaction temperatures from about 200° F. to about 1000° F. at elevated pressures and in the presence of water and an effective intensity of ultrasonic waves having a frequency of about 20 kHz to about 55 kHz to form product gases comprising primarily methane and carbon dioxide.

4,954,247

PROCESS FOR SEPARATING HYDROCARBONS

Gregory M. Lipkin, Secaucus, and Joseph L. Niedzwiecki, Fanwood, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 17, 1988, Ser. No. 258,531
Int. Cl.[5] C10G 7/06
U.S. Cl. 208—355 10 Claims



1. In a process for separating a fluid hydrocarbonaceous mixture comprising the steps of:

(a) introducing said hydrocarbonaceous mixture into an atmospheric distillation zone to separate said oil into fractions, including a heavy bottoms fraction;

(b) passing at least a portion of said heavy bottoms fraction to a heating zone;

(c) introducing the resulting heated portion of said heavy bottoms fractions to a separation zone maintained under vacuum to produce fractions, including a vacuum residuum fraction;

(d) recycling at least a portion of said vacuum residuum fraction to said vacuum separation zone;

the improvement which comprises:

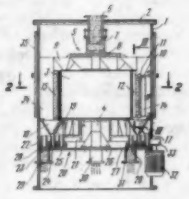
(e) passing directly as a separate stream at least a portion of said heavy bottoms fraction of step (a) from said atmospheric distillation zone to the bottom stripping part of said vacuum separation zone.

4,954,248

ELECTRICAL DRUM-TYPE SEPARATOR

Anatoly I. Urvantsev, ulitsa Panelnaya, 11a, kv. 30; Jury S. Elantsev, ulitsa Bardina, 3, korpus 3, kv. 1; Alexei M. Komlev, ulitsa P. Tolyatti, 7, kv. 53; Saliman K. Kusembaev, ulitsa Sofii Perovskoi, 103, kv. 23, all of Sverdlovsk; Jury I. Stepanov, Svetlanovsky prospekt, 79, kv. 146, and Viktor P. Vasiliev, Nevsky prospekt, 27, kv. 43, both of Leningrad, all of U.S.S.R.

PCT No. PCT/SU87/00043, § 371 Date Dec. 16, 1988, § 102(e) Date Dec. 16, 1988, PCT Pub. No. WO88/08331, PCT Pub. Date Nov. 3, 1988
PCT Filed Apr. 21, 1987, Ser. No. 294,561
Int. Cl.[5] B03C 7/12
U.S. Cl. 209—127.1 5 Claims



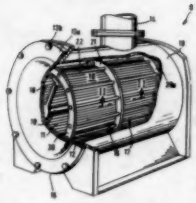
1. An electrostatic drum-type separator for separating a mixture of electrically conductive and non-conductive particles, comprising a housing having mounted thereinside a rotatable drum serving as a precipitation electrode, means for feeding a mixture of loose materials onto a peripheral surface of the drum, a corona-discharge electrode spaced from the peripheral surface of the drum for electrically charging particles of the mixture of loose materials in an electric field set up between the corona-discharge electrode and a portion of the peripheral surface of the drum, a brush for sweeping non-conductive particles off the peripheral surface of the drum, arranged behind the corona-discharge electrode in a direction of rotation of the drum, and main receptacles arranged in a direction of the streams of electrically conductive particles, aggregates of electrically conductive and non-conductive particles, and non-conductive particles, the drum being mounted so that its axis extends vertically, there being provided at least one additional corona-discharge electrode spaced from the peripheral surface of the drum, and additional brushes for sweeping non-conductive particles off the peripheral surface of the drum, equalling in number the additional corona-discharge electrodes, each additional brush being arranged behind the respective one of the additional corona-discharge electrodes in the direction of rotation of the drum, and additional receptacles arranged in the respective paths of the additional streams of electrically conductive particles, aggregates of electrically conductive particles and non-conductive particles, and non-conductive particles, the main and additional corona-discharge electrodes and brushes being spaced substantially uniformly about the periphery of the drum, and the main and additional receptacles being arranged to underlie the drum.

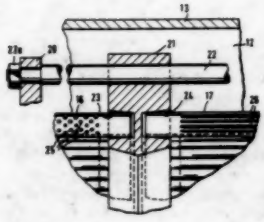
4,954,249

WAVE SCREEN PLATE

William Gero, and Frank Paskowski, both of Pittsfield, Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Jun. 10, 1988, Ser. No. 206,151
Int. Cl.[5] B07B *1/46*
U.S. Cl. 209—273 7 Claims





1. A modular screen plate assembly for use in screening apparatus in which stock to be screened is introduced on one side of the screen plate assembly, with some of said stock flowing through said screen plate assembly to the opposite side thereof, said modular screen plate assembly comprising:

a generally cylindrically shaped screen plate section formed from relatively thin material defining a series of adjacent undulations, said generally cylindrical screen plate section having inner surfaces and outer surfaces defined by said undulations;

rigid annular ring support members disposed at opposite ends of said generally cylindrical screen plate section, said rigid annular ring support members each having annular grooves therein, each of said grooves being defined by radially inner and radially outer groove side walls, a groove bottom, and a groove opening in a surface of the rigid annular ring support member, said grooves being adapted for receiving therein end edges of said cylindrical screen plate section, said openings to said grooves of said rings being at least partly radially inward in said annular rings from at least part of said groove bottoms, and said inner surfaces of said screen plate section being substantially in line with said inner surface of said annular rings; and

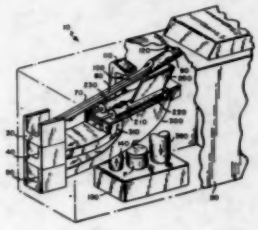
tie members disposed between said rigid annular ring support members, fixing said rigid support members in location relative to each other, and securing said cylindrical screen plate section in said grooves of said rigid annular ring support members.

4,954,250

FLATWARE SEPARATING APPARATUS

Clyde Weihe, Needham Heights; Lewis Maroti, Melrose, and Peter Albertini, Dover, all of Mass., assignors to Food Service Innovations, Inc., Dover, Mass.

Filed May 16, 1989, Ser. No. 352,356
Int. Cl.[5] B07C *5/12*
U.S. Cl. 209—629 39 Claims



1. A flatware separating apparatus comprising:

a track means having a top surface for receiving and delivering different items of flatware along a selected path;

means for contacting selected items of the flatware at a selected point along the path of the track means and pushing the selected items off the surface of the track means and allowing other selected items of the flatware to remain on the surface; and

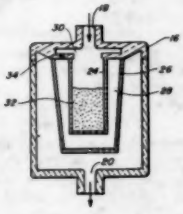
means for further separating the selected items of flatware pushed off the surface of the track means.

4,954,251

CONCENTRIC MICROAGGREGATE BLOOD FILTER

Bruce E. Barnes, Kensington; Richard Furuzawa, Berkeley, and Paul Kahn, San Francisco, all of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed Jan. 31, 1989, Ser. No. 304,735
Int. Cl.[5] B01D *29/35, 29/58*
U.S. Cl. 210—806 12 Claims



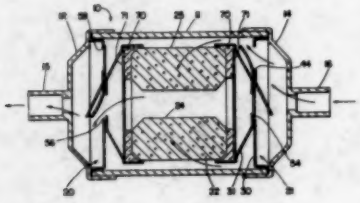
1. A microaggregate blood filtering system comprising a flexible, filter housing having inlet and outlet ports and an interior containing two generally elongated concentric filtering screens, an inner pre-filter screen and an outer microaggregate filter screen, the inner pre-filter screen having an average pore size of about 150 microns and being adapted to receive blood from the inlet port and adapted to hold back blood aggregates larger than about 150 microns without substantially interfering with the passage of smaller micro aggregates through the inner filter, and the outer filter screen having an average pore size of about 40 microns and being adapted to hold back blood microaggregates larger than about 40 microns without substantially interfering with the passage of smaller aggregates through the outer filter and the outlet port.

4,954,252

BIFLOW FILTER DRIER

Gary E. Griffin, Penn Yan, and Walter O. Krause, Newark, both of N.Y., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 59,087, Jun. 8, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,588
Int. Cl.[5] B01D *27/02, 35/15*
U.S. Cl. 210—136 18 Claims



1. A bidirectional filter drier, comprising
a casing having opposed ends,
closure means at said opposed ends,
a flow port in each of said closure means,
first and second check valve assemblies supported in said casing at said opposed ends, and
filter drier means supported by and between said valve assemblies,
each said check valve assembly comprising
first and second supports respectively having first and second openings therein, and
a valve plate disposed between said first and second supports,
said valve plate having first and second flapper valves respectively disposed adjacent said first and second openings normally to close said openings, said flapper valves being movable in opposite directions away from said respective openings in response to fluid flow in respective opposite directions through said drier, said second opening in each said second support being centrally located, and said filter drier means including a tubular core of desiccant material having a central passage communicating with and extending between said centrally located second openings in said second supports, and wherein
said first support is a centering plate having a central opening, said first opening is offset from said central opening, said second support is a core support cup having a flat bottom wall and a conical sidewall, said centrally located second opening is located in said bottom wall, said valve plate has an annular support portion surrounding said second flapper valve adjacent said second opening, and said support portion is sandwiched between said support cup bottom wall and said centering plate to maintain the same in spaced apart parallel relationship.

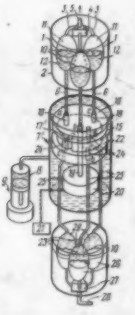
4,954,253

DEVICE FOR PREPARING A GRADIENT SOLUTION FOR A HIGH-PRESSURE LIQUID CHROMATOGRAPH

Maxim L. Alexandrov; Vsevolod V. Shevkunov, and Alexandr J. Pavlov, all of Leningrad, U.S.S.R., assignors to Nauchno-Tekhnicheskoe Objedinenie Akademii Nauk SSSR, Leningrad, U.S.S.R.

Continuation of Ser. No. 332,932, Jan. 23, 1989, abandoned, which is a continuation of Ser. No. 307,309, Jan. 23, 1989, abandoned. This application Aug. 7, 1989, Ser. No. 390,702
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 2 Claims

1. A device for preparing a gradient solution for a high-pressure liquid chromatograph comprising vessels (1) containing eluents communicating by way of pipes (6) through a switch-over unit (7) with a displacement chamber (8) of a piston-type pump (9) and through a mixer (4) with the inlet of a chromatographic column characterized in that each of the eluent-containing vessels (1) is provided with a movable partition (10) dividing the interior of the vessel (1) into two chambers (11,12), the chamber (11) communicating with the mixer (4) and filled with an eluent, whereas the chamber (12) is filled with an inert liquid and communicates with the switch-over unit (7) fashioned as a flow-through chamber (13) arranged between outlets (14) of the pipes (6) and displacement chamber



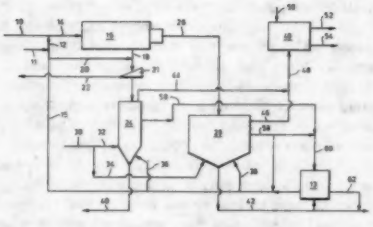
(8) of the piston-type pump (9), and a rotatable switch-over valve disposed inside the flow-through chamber (13) of the rotatable valve having a rotor (15) and a stator (16), the rotor (15) having one through passage (17) communicating with the interior of the flow-through chamber (13), the stator (16) having through passages (18) equal in number to the number of eluent-containing vessels (1), each communicating through the pipe (6) with the corresponding vessel (1) and arranged so that during rotation of the rotor (15) the through passage (17) provided therein can alternately connect it to the passages (18) of the stator (16).

4,954,254

METHOD AND APPARATUS FOR SEPARATION OF HETEROGENEOUS PHASES

Aldo Corti, Calgary, Canada, and John A. Falcon, Milan, Italy, assignors to Gulf Canada Corporation and RTR Oil Sands (Alberta) Ltd., both of Calgary, Canada

Division of Ser. No. 47,356, May 6, 1987, Pat. No. 4,828,688. This application Mar. 8, 1989, Ser. No. 320,759
Int. Cl.[5] B01D *21/06*
U.S. Cl. 210—209 2 Claims



1. A phase separation device to separate a feed into a tailings phase and at least one other phase comprising:
a feed inlet to allow said feed to enter the vessels;
a vessel wherein said feed separates into a tailings phase and at least one other phase;

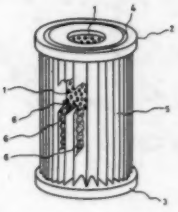
outlets for each of the separated phases;
a rake rotatably mounted near the base of vessel to rake the tailings phase in the base of the vessel; and
a water injector for injecting water with air dissolved therein under pressure, said injector being supported on said rake and rotatable therewith at a location directly below the interface of said tailings phase and said other phase.

4,954,255

FILTERING APPARATUS WITH PLEATED FILTERING MATERIAL

Roger Müller, Aedermannsdorf, and Giancarlo Bee, Welschenrohr, both of Switzerland, assignors to S.F. Müller & Partner, Egerkingen, Switzerland

Filed Mar. 20, 1989, Ser. No. 326,222
Claims priority, application Switzerland, Apr. 2, 1988, 01227/88; Oct. 15, 1988, 03838/88
Int. Cl.[5] B01D *27/06*
U.S. Cl. 210—437 **12 Claims**



1. A filtering apparatus having an inflow side and an outflow side, comprising:
at least one filtering material pleated in fanfold manner and arranged between the inflow side and the outflow side of the filtering apparatus;
said at least one pleated filtering material containing a plurality of pleats which are open towards said inflow side and a plurality of pleats which are open towards said outflow side;
each pleat of said at least one pleated filtering material having a predetermined pleat depth;
each one of said plurality of pleats which are open towards said inflow side containing a rounded base;
said rounded base having a radius in the range of 0.05 to 0.3 times said predetermined pleat depth;
each one of said plurality of pleats which are open towards said outflow side being structured to possess an acute angle;
a dimensionally stable insert positioned within said each one of said plurality of pleats which are open towards said outflow side;
each said dimensionally stable insert is formed of a substantially flat material comprising bilaterally protuberant deformations; and
at least said bilaterally protuberant deformations being provided with holes.

4,954,256

HYDROPHOBIC MEMBRANES

Peter J. Degen, Huntington; Isaac Rothman, Brooklyn, and Thomas C. Gsell, Glen Cove, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed May 15, 1989, Ser. No. 351,219
Int. Cl.[5] B01D *25/04*
U.S. Cl. 210—490 **18 Claims**

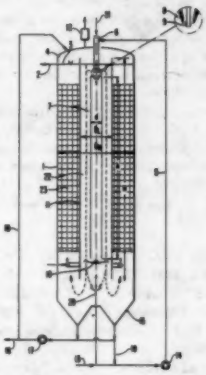
1. A microporous polymeric membrane having pores with diameters of about 0.05 μm or greater and a CWST less than about 28 dynes/cm comprising a microporous polymeric membrane substrate and, permanently chemically bonded to all portions of the surface thereof, a superstrate fluoropolymer formed from a monomer containing an ethylenically unsaturated group and a fluoroalkyl group.

4,954,257

BIOLOGICAL PURIFICATION LOOP DEVICE AND METHOD HAVING DEFLECTOR PLATE WITHIN GUIDE PIPE

Alfons Vogelpohl, Clausthal-Zellerfeld, and Norbert Rabiger, Meisenweg, both of Fed. Rep. of Germany, assignors to Tecon GmbH, Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 313,849
Int. Cl.[5] C02F *3/02*
U.S. Cl. 210—607 **19 Claims**



9. A process for biological purification of pollutant-containing water in a reactor, such that said reactor is a closed vessel, and said purification is carried out by means of loop operation, said reactor comprising:
(a) an insertable pipe located centrally and vertically within said vessel, such that said pipe is open at both ends, with the entrance end having a two-fluid nozzle project therein such that a biomass-water-gas mixture to be pruified may be fed into said pipe,
(b) a guide pipe having imperforate walls located concentrically around said insertable pipe within said vessel, such that said pipe is open at both ends and such that an inner annulus is formed between said insertable pipe and said guide pipe and an outer annulus is formed between said guide pipe and said vessel, said guide pipe projecting above and below the ends of said insertable pipe,
(c) a deflector plate located below the exit end of said insertable pipe and within said guide pipe, such that said biomass-water-gas mixture is partly deflected into said inner annulus, and
(d) at least one conically shaped sedimentation chamber located in the lower part of the reactor, such that said chamber is below the exit ends of said guide and said insertable pipes, wherein said process comprises the steps of
(i) a biomass-water-gas mixture is fed into the insertable pipe of the reactor by means of the two-fluid nozzle;
(ii) said mixture is deflected toward the inner annulus by means of the deflector plate, such that part of the mixture flows upward into the inner annulus, part flows downward through a suction pipe, and part flows into the outer annulus;
(iii) the part of the mixture emerging at the upper end of the inner annulus is mixed with freshly incoming water-

gas-biomass mixture by a driving-jet action of the two-fluid nozzle and is fed into the insertable pipe;

(iv) the part of the mixture flowing upward in the outer annulus is subjected to a posttreatment reaction; and

(v) said water from the biomass-water-gas mixture is removed as purified water from the reactor through an outlet pipe.

4,954,258

MICROBIOLOGICAL DEGRADATION OF HALOGENATED HYDROCARBONS IN WATER

C. Deane Little, 619 Watson Ave., Pensacola, Fla. 32503

Filed Nov. 10, 1988, Ser. No. 269,642

Int. Cl.[5] C02F *3/00, 3/02*

U.S. Cl. 210—611 **7 Claims**

1. In the process of degrading halogenated aliphatic hydrocarbons by the aerobic growth in water of methanotrophic bacteria in the presence of a source of oxygen and an alkane as the principal carbon source, the improvement which comprises substituting at least a growth stimulating quantity of at least one lower alkanol as a carbon source for a substantial quantity of said alkane.

7. The process of degrading 1,1,2-trichloroethylene in water by allowing at least one methanotrophic bacteria to grow in the water in the presence of a source of oxygen and at least a growth stimulating quantity of methanol as substantially the sole source of carbon.

4,954,259

PROCESS FOR THE TREATMENT AND PURIFICATION OF WATER BY THE FLOCCULATION OF SUSPENDED PARTICLES IN A FLUIDIZED BED

Samuel Elmaleh, Castelnau le Lez, and Alain Grasmick, Montferrier/Lez, both of France, assignors to Mornex Limited, London, England

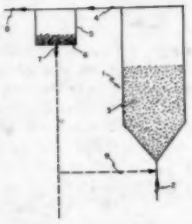
Continuation of Ser. No. 735,862, May 20, 1985, Pat. No. 4,743,376. This application Jan. 26, 1988, Ser. No. 148,498

Claims priority, application France, May 23, 1984, 84 08026; Nov. 16, 1984, 84 17539

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[5] C02F *1/54*

U.S. Cl. 210—617 **16 Claims**



1. A process for separating particles selected from the group consisting of organic particles, inorganic particles, and mixtures thereof of suspended matter from water comprising the steps of:

(a) providing in said water sufficient bacteria to secrete an effective amount of flocculating agent, and passing the water through unsaturated granular material as a fluidized bed to flocculate into aggregates said bacteria and said particles in said fluidized bed,

(b) collecting the flocculated aggregates downstream from the fluidized bed, and

(c) subjecting the water to a suitable liquid/solid separation technique,

whereby separately a liquid effluent and solid aggregates of the flocculated particles are produced wherein the ratio of the velocity of said effluent to the minimum velocity of the granular material is between 1.1 to 15, the particle-size of the granular material is between about 50 μm and 1 cm, and the density of the granular material is between 0.8 and 3 g/cm^3.

4,954,260

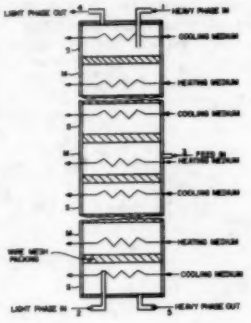
COUNTERCURRENT SEPARATION PROCESS AND APPARATUS

Zvi Ludmer, Kefar Gibton, Rehovot 76910, Israel; Reuel Shinnar, 110 Ash Dr., Great Neck, N.Y. 11021, and Victor Yakhot, 10 Braeburn Dr., Princeton, N.J. 08540

Filed Jun. 8, 1989, Ser. No. 363,156

Int. Cl.[5] B01D *11/04*

U.S. Cl. 210—634 **19 Claims**



1. A countercurrent separation process having a multiplicity of stages, each stage including a mixer zone and a settler zone which comprises: passing a first solvent and a second solvent in countercurrent flow path through said stages, said solvents being fully miscible at a first temperature and forming two phases at a second temperature; maintaining the first temperature in the mixer zone and the second temperature in the settler zone of each stage; feeding at least one solute, one of which is preferentially soluble in said first solvent, into said flow path; and recovering said first solvent, rich in said preferentially soluble solute, from one end of said flow path and recovering said second solvent, lean in said preferentially soluble solute, from the opposite end of said path.

4,954,261

METHOD FOR EXTRACTING COMPOUNDS HAVING A HIGH ADDED VALUE FROM COMPLEX SOLUTIONS AND MEMBRANE DEVICE FOR IMPLEMENTING SUCH METHOD

Stéphane Alexandre, Saint Etienne Du Rouvray; Michel Thellier, Darnetal, and Jean-Claude Vincent, Cleres, all of France, assignors to Centre National de la Recerche Scientifique - Cnrs, Paris, France

PCT No. PCT/FR87/00180, § 371 Date Jan. 30, 1989, § 102(e) Date Jan. 30, 1989, PCT Pub. No. WO87/07294, PCT Pub. Date Dec. 3, 1987

PCT Filed May 22, 1987, Ser. No. 309,765

Claims priority, application France, May 30, 1986, 86 07792

Int. Cl.[5] B01D *63/08*

U.S. Cl. 210—638 **17 Claims**

1. A method of selective extraction of a compound from a complex solution comprising:

introducing said solution into a system comprising a cell subdivided into two compartments by a reactive membrane system, said two compartments comprising donor compartment D and receptor compartment R;

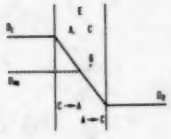
said reactive membrane system comprising a membrane structure carrying enzymatic catalysts which confer enzy-

matic activity on said membrane structure, a first barrier layer provided on a first surface of said membrane, and a second barrier layer provided on a second surface of said membrane, said barrier layers adapted to prevent the passage through said active membrane of substance other than the compound to be extracted;

transporting the compound to be extracted from donor compartment D to an intramembranal space containing a liquid medium, using a monoenzymatic reactive membrane system suitable for catalyzing a reversible reaction;

wherein in said intermembranal space are contained at least the compound to be extracted;

establishing an electrochemical potential gradient of said at least one compound, said gradient creating asymmetric functional conditions which conditions force the reversible reaction to be conducted in one direction on one side of the reactive membrane system and in the other direction on the other side of the reactive membrane system;



providing means for providing an alternative to a pressurization means including a reaction loop which makes said compound to be extracted pass from the one side of the reactive membrane to the other side of the reactive membrane, said compound to be extracted accumulates on said other side of said reactive membrane, wherein said transport is facilitated by the presence on one of the two side of said membrane a layer facilitating transport intermembranal space at least one compound other than said compound to be extracted; and

recovering said compound to be extracted in receptor compartment R.

4,954,262

METHOD AND APPARATUS FOR RECOVERING SULFURIC ACID FROM A TITANIUM SULFATE WASTE LIQUOR

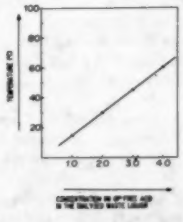
Yoshiharu Aoki, and Toshikatsu Hamano, both of Chiba, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 429,379

Claims priority, application Japan, Nov. 8, 1988, 63-280412; Dec. 6, 1988, 63-306977; Dec. 22, 1988, 63-321916

Int. Cl.[5] B01D *61/32*

U.S. Cl. 210—638 **12 Claims**



1. A method for recovering sulfuric acid from a titanium sulfate waste liquor by diffusion dialysis in a diffusion dialytic cell provided with anion exchange membrane, which comprises;

subjecting the titanium sulfate waste liquor to precision filtration to remove a solids content having a particle size of at least 0.1 μm to a level of not more than 100 μg/l; and

placing the filtered liquor to face water with an anion exchange membrane interposed therebetween so that sulfuric acid in the titanium sulfate waste liquor is recovered by diffusion dialysis at a temperature sufficiently low to substantially preclude adherence of titanium oxide particles to said membrane.

4,954,263

COAGULATION TREATMENT OF FLUIDS

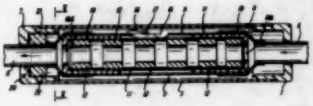
Derek A. Woodhouse, Stafford, England, assignor to D.A.W. Enterprises Limited, England

Filed Mar. 31, 1988, Ser. No. 175,769

Claims priority, application United Kingdom, Apr. 4, 1987, 8708115

Int. Cl.[5] B01D *35/06*; C02F *1/48, 1/50*

U.S. Cl. 210—695 **26 Claims**



1. A method for the treatment of a fluid comprising introducing oligo-dynamic particles into the fluid by electrolytic means using the fluid as an electrolyte whereby to form sites for coagulation and crystal formation in the fluid, passing the fluid between like magnetic poles generating a repulsive magnetic field, and permitting the thus treated particles to remain in and flow with the fluid whereby to enhance subsequent coagulation and crystal formation of the introduced particles and particles already present in the fluid.

4,954,264

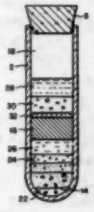
APPARATUS FOR SEPARATING MONONUCLEAR CELLS FROM BLOOD AND METHOD OF MANUFACTURING AND USING THE SAME

Ward C. Smith, Mahwah, N.J., assignor to Becton-Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 2, 1989, Ser. No. 305,953

Int. Cl.[5] B01D *33/02*; B04B *3/00*; A61K *35/14*

U.S. Cl. 210—782 **41 Claims**



1. Apparatus for separating mononuclear cells from blood, which comprises:

a collection tube having a bottom closed end and an opposite open top end for receiving a blood sample, and being adapted to be centrifuged;

a first layer of a liquid density gradient medium contained in the collection tube and situated at the closed end of the tube;

a second layer of a gel-like substance contained in the collec-

tion tube and placed on top of the first layer of liquid density gradient medium, the second layer having a specific gravity which is less than that of the first layer so that it floats on top of the first layer; and

a porous foam member contained in the collection tube and situated on top of and in contact with the second layer of gel-like substance;

the collection tube being of sufficient size to define a free space above the porous foam member to receive a blood sample;

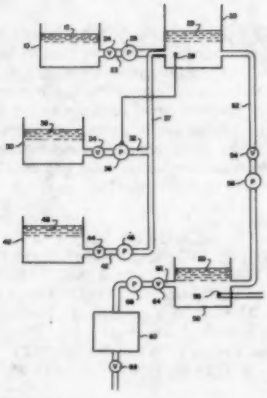
the second layer of gel-like substance being adapted to coat a portion of the porous foam member with which it is contact to form a hydraulic barrier between a blood sample received by the tube and the first layer of liquid density gradient medium to prevent intermixing of the first layer and the blood sample prior to centrifuging the tube.

4,954,265

METHOD OF PROCESSING SPENT ELECTROLESS BATH AND BATH FOR USE THEREIN

Bernard Greenberg, Brooklyn, and Andrew Sulner, New York, both of N.Y., assignors to Environmental Recovery Systems, Inc., New York, N.Y.

Filed Feb. 1, 1989, Ser. No. 305,246
Int. Cl.[5] B01D *21/01*; C02F *1/54*
U.S. Cl. 210—710 **33 Claims**



1. A method of processing an aqueous feed liquid to precipitate at least one metal in a form to make the metal subsequently removable from the feed liquid by filtration, comprising the steps of:

(a) adding a base to an aqueous feed liquid containing a soluble salt of the metal to be removed, wherein the metal is selected from the group consisting of nickel, copper and combinations thereof, the base being in a quantity sufficient to precipitate a metal oxalate;

(b) thereafter, mixing with the feed liquid oxalic acid in excess of that required to react with the metal and a pH-adjusting liquid in a quantity sufficient to lower the pH of the feed liquid to a point between that at which the feed liquid becomes slightly supersaturated with respect to the oxalate of the metal and that at which precipitation of the metal oxalate is initiated;

(c) allowing the mixture to stand for a period of time sufficient to form metal oxalate; and

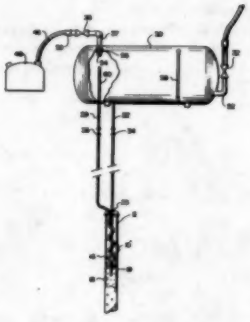
(d) separating the formed metal oxalate from the feed liquid to leave an aqueous liquid in which the metal concentration is less than about four parts per million .

4,954,266

METHOD AND SYSTEM FOR RECOVERING FREE FLOATING LIQUIDS FROM GROUND WATER

Lowell Lingo, Jr., R.D. #1, Box 53, Pleasant Valley Rd., Morrisville, N.Y. 13408

Filed Oct. 3, 1988, Ser. No. 252,648
Int. Cl.[5] E02B *15/08*
U.S. Cl. 210—747 **6 Claims**



1. A method of removing a liquid hydrocarbon having a specific gravity less than one from the surface of a body of water within a pre-drilled well upon which said hydrocarbon is floating solely by means of barometric and gravitational forces, without the use of externally powered means, said method comprising:

(a) positioning an airtight reservoir at a vertical level higher than that of said first liquid;

(b) filling said reservoir with water;

(c) providing a vent selectively movable between open and closed positions in an upper portion of said reservoir, opening said vent to permit communication of said reservoir with the atmosphere during said filling step, and closing said vent to render said reservoir airtight upon completion of said filling step;

(d) connecting upper and lower ends of an enclosed, elongated first tube in airtight communication with the interior of said reservoir and said body of water within said well, respectively;

(e) connecting upper and lower ends of an enclosed, elongated second tube in airtight communication with the interior of said reservoir and a floatation device, respectively;

(f) placing said floatation device in said body of water within said well, said floatation device having a buoyancy so related to the specific gravities of said first liquid and said body of water that said second tube lower end remains just below the surface of said hydrocarbon as the distance between said reservoir and the surface of said hydrocarbon varies;

(g) positioning at least one selectively actuable valve in each of said first and second tubes, closing said valves during said filling step, and opening said valves following closing of said vent; and

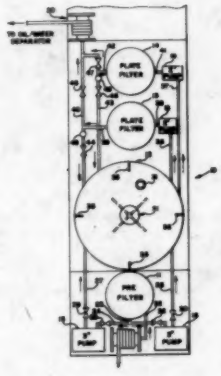
(h) permitting said water to flow through said first tube by gravity out of said reservoir into said well and said hydrocarbon to rise through said second tube by barometric pressure into said reservoir to replace said water flowing therefrom.

4,954,267

HYDROCARBON RECLAIMER SYSTEM

Michael J. Uremovich, R.R. #2, Elwood Rd., Manhattan, Ill. 60442

Filed May 2, 1989, Ser. No. 346,132
Int. Cl.[5] B01D *37/02*
U.S. Cl. 210—771 19 Claims



1. A filtering process for filtering sludge from a finished product oil storage tank and thereby separating solids from oil and hydrocarbon, the process requiring no added water, solvents or diluents and comprising the steps of:

pumping a volume sludge from a finished product oil storage tank to a mixing tank;

mixing the sludge;

sampling the sludge to determine solid content;

adding filter aid comprising diatomaceous earth to the mixing tank;

mixing the filter aid with the sludge in the mixing tank;

enclosing and sealing a plurality of filter plates inside a horizontal plate filter;

pressurizing said horizontal plate filter by operation of pump means;

pumping the sludge from the mixing tank through the horizontal plate filter to filter out solids;

recirculating the sludge from the horizontal plate filter back through the mixing tank; and,

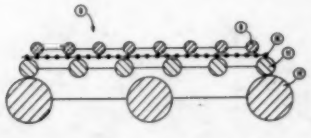
pumping a purified hydrocarbon and water filtrate from the horizontal plate filter.

4,954,268

PROCESS FOR REMOVING CELLULOSE ETHERS FROM A CELLULOSE ETHER SUSPENSION

Guenther Just, Verdistrasse 48, 4010 Hilden, and Willi Wuest, Fasenenring 32, 4030 Ratingen, both of Fed. Rep. of Germany

Filed Feb. 3, 1989, Ser. No. 306,427
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803370
Int. Cl.[5] B01D *33/48*
U.S. Cl. 210—772 20 Claims



1. In a process for removing cellulose ethers from a cellulose ether particle suspension in which the cellulose ethers are recovered as a filter cake from a pressure filtration, the improvement wherein said pressure filtration is conducted in a rotary pressure filter containing a multi-layered wire mesh filter medium comprised of mesh layers having different mesh sizes wherein said filter medium comprises a multi-layer square-opening mesh, linen-bonded to a filter cloth with at least one protective mesh on each side and wherein said filter cloth has a mesh size corresponding to about the mean particle diameter size of the cellulose ether suspension particles and, subsequent to removal of said filter cake from said filter medium, said filter medium is cleaned with steam, compressed air or water under pressure.

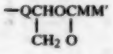
4,954,269

DIOXOLANE FUNCTIONAL SILICON COMPOUNDS AND METHOD FOR THEIR PREPARATION AND USE

Peter Y. K. Lo, Midland, and Anthony Revis, Freeland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 10, 1989, Ser. No. 377,346
Int. Cl.[5] D06M *7/00*
U.S. Cl. 252—86 17 Claims

1. A method of treating textiles in order to increase the water absorptivity of the textiles comprising contacting the textiles with an effective amount of a dioxolane-substituted organosilicon compound containing at least one silicon-bonded dioxolane radical having the formula



where Q is a divalent organic radical which is bonded to the silicon atom by way of a silicon-carbon bond, M is a monovalent hydrocarbon radical free of aliphatic unsaturation containing from 1 to 6 carbon atoms and M′ is H or M; all remaining silicon valences of the dioxolane-substituted organosilicon compound being satisfied by radicals free of aliphatic unsaturation selected from the group consisting of monovalent hydrocarbon radicals, monovalent halohydrocarbon radicals, monovalent hydrolyzable radicals, hydrogen atoms and divalent radicals joining silicon atoms.

4,954,270

FABRIC SOFTENING COMPOSITION: FABRIC SOFTENER AND HYDROPHOBICALLY MODIFIED NONIONIC CELLULOSE ETHER

Robert M. Butterworth, Heidelberg, Fed. Rep. of Germany, and Kenwyn D. Saunders, New Malden, Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,379
Claims priority, application United Kingdom, Mar. 1, 1988, 8804818
Int. Cl.[5] C11D *1/62, 3/22;* D06M *13/18, 15/09*
U.S. Cl. 252—8.8 6 Claims

1. An aqueous fabric conditioning composition comprising

(i) a fabric softener selected from the group of water-insoluble quaternary ammonium compounds, water-insoluble hydrocarbyl imidazolinium compounds, nonionic fabric softening agents, amine softening materials or mixtures thereof; and

(ii) from 0.01 to 0.30% by weight of a nonionic cellulose ether which is a methyl, hydroxyethyl or hydroxypropyl cellulose having a degree of substitution sufficient to make it water soluble prior to being hydrophobically modified which has been hydrophobically modified by substitution with one or more hydrocarbon radicals having 10–24 carbon atoms in an amount between 0.20% by weight and the amount which renders the modified cellulose ether less than 1% by weight soluble in water at 20° C.

4,954,271

NON-TOXIC FIRE EXTINGUISHANT

Raymond W. Green, Vancouver, Canada, assignor to Tag Investments, Inc., Vancouver, Canada

Filed Oct. 6, 1988, Ser. No. 255,133
Int. Cl.[5] A62D *1/00*; A62C *1/00, 3/00*
U.S. Cl. 252—8 4 Claims

1. A non-toxic fire extinguishant consisting essentially of:
65% trichlorofluoromethane,
15% dichlorodifluoromethane,
15% 1,2-dichlorotetrafluoroethane, and 5% dipentene by weight of the overall extinguishant.

4,954,272

PROCESS FOR PREPARING OVERBASED CALCIUM SULFONATES

Tze C. Jao, Fishkill; Nancy A. Morton, Hopewell Junction, both of N.Y., and Robert W. Erickson, Jr., Nederland, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 27, 1989, Ser. No. 329,129
Int. Cl.[5] C10M *135/10*
U.S. Cl. 252—25 7 Claims

1. A process for producing an overbased oil soluble calcium sulfonate having a TBN of 325, said process comprising:
(a) diluting a neutral calcium sulfonate with a hydrocarbon solvent and a lower alkanol;
(b) adding to the diluted calcium sulfonate solution, CaO, $Ca(OH)_2$ and H_2O in molar ratios of $CaO:Ca(OH)_2$ of about 90:10 to about 20:80 and of $H_2O:CaO$ of about 0.15:1 to about 0.30:1;
(c) heating the sulfonate mixture to a temperature ranging from about 100° F. to about 170° F. under a pressure ranging from about 0 to about 50 psig;
(d) passing CO_2 into the heated sulfonate mixture for a period of about 50 to about 200 minutes;
(e) adding a diluent oil to the CO_2 treated sulfonate mixture;
(f) separating the solids from the liquid of the sulfonate mixture; and
(g) stripping the hydrocarbon solvent from the resulting over-based oil soluble sulfonate product having TBN of 325.

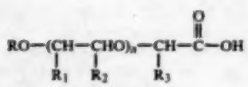
4,954,273

OIL FORMULATIONS CONTAINING OVERBASED MULTI-FUNCTIONAL ADDITIVE

Richard A. Denis, Auburn Township, Cuyahoga County, and Frederick W. Koch, Willoughby Hills, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 20,287, Feb. 27, 1987, Pat. No. 4,784,781. This application Oct. 27, 1988, Ser. No. 263,578
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[5] C10M *105/22*
U.S. Cl. 252—39 20 Claims

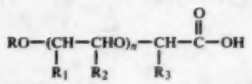
1. A crank case oil composition, comprising:
an oil of lubricating viscosity in an amount of 50% or more by weight based on the total weight of the composition and a minor amount, sufficient to improve performance characteristics of the composition of oil dispersible additive, comprising:
an overbased salt of a compound having structural formula (I)



(I)

wherein R is a hydrocarbyl containing 1 to 44 carbons, R_1, R_2, and R_3 are independently hydrogen or an alkyl moiety containing 1 to 21 carbons, and n is in the range of from 1 to 20.

12. An oil additive concentrate, comprising:
about 10% to about 50% by weight of an oil of lubricating viscosity; and
an overbased salt of a compound having structural formula (I):



(I)

wherein R is a hydrocarbyl containing 1 to 44 carbons, R_1 and R_3 are hydrogen and R_2 is hydrogen or methyl, and n is an integer in the range of from 1 to 20.

4,954,274

SULFURIZED OLEFIN EXTREME PRESSURE ADDITIVES

Edward F. Zaweski, 12260 Brookshire Ave., Baton Rouge, La. 70815, and James G. Jolly, 5233 Halls Ferry Dr., Baton Rouge, La. 70817

Continuation of Ser. No. 138,937, Dec. 29, 1987, abandoned. This application Jun. 6, 1989, Ser. No. 363,443
Int. Cl.[5] C10M *135/02*
U.S. Cl. 252—45 16 Claims

1. A sulfurized olefinic lubricating oil additive which imparts extreme pressure properties made by the process comprising (i) reacting sulfur monochloride with aliphatic monoolefin consisting essentially of monoolefin selected from isobutene, 2-methyl-1-butene and 2-methyl-2-butene, wherein the ethylenic double bond adjoins a tertiary carbon atom, in the presence of minor amounts of an active Lewis acid at about 30°–100° C. using about 0.45 to 1.5 gram moles of aliphatic monoolefin for each 0.3 to 0.75 gram mole of sulfur monochloride to produce an adduct which, after sulfurization, affords a lubricant additive which is soluble at a concentration of 5 percent by weight at a temperature of 0° C. in polyalphaolefin synthetic oils, (ii) reacting the adduct so produced with sulfur and sodium sulfide in an aqueous alkanol medium at a temperature of about 50° C. up to reflux using about 0.02–0.4 gram atom of sulfur gram mole of sodium sulfide, and (iii) recovering said additive.

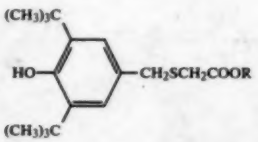
4,954,275

USE OF PHENOL-MERCAPTOCARBOXYLIC ACID ESTERS AS STABILIZERS FOR LUBRICANTS

Siegfried Rosenberger, Riehen, and Kurt Schwarzenbach, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 919,605, Oct. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 347,399, Feb. 10, 1982. This application Nov. 19, 1986, Ser. No. 932,431
Claims priority, application Switzerland, Feb. 29, 1981, 1107/81
Int. Cl.[5] C10M *135/26*
U.S. Cl. 252—48.6 3 Claims

1. A lubricant composition comprising mineral oil or synthetic oil or mixture thereof and an effective stabilizing amount of a compound of the formula



wherein R is C_8–C_{13} alkyl.

4,954,276

LACTONE MODIFIED ADDUCTS OR REACTANTS AND OLEAGINOUS COMPOSITIONS CONTAINING SAME

Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 916,113, Oct. 7, 1986, Pat. No. 4,866,139.
This application Aug. 31, 1989, Ser. No. 401,603
Int. Cl.[5] C10M *155/00, 155/04*
U.S. Cl. 252—49.6 91 Claims

1. A C_5–C_9 lactone adduct material useful as an oil additive and formed by first reacting at a temperature of from about 100 to about 250° C. for a period of from about 1 to about 10 hours a hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material (I) with the reaction product (II) of a C_5–C_9 lactone with a member selected from the group consisting of (a) a polyamine having from about 2 to 60 total carbon atoms and from about 2 to about 12 nitrogen atoms, (b) an aliphatic polyhydric alcohol containing up to about 100 carbon atoms and from about 2 to about 10 **10** hydroxyl groups, (c) an amino alcohol containing up to about 50 total carbon atoms, from 1 to about 3 nitrogen atoms and from 1 to about 15 hydroxyl groups, or (d) mixtures thereof, and then post-treating the reaction product of (I) and (II) with a boron compound; said reaction product (II) being prepared at a temperature of from about 30 to about 200° C. when said C_5–C_9 lactone is reacted with said polyamine and at a temperature of about 50 to about 200° C. when said C_5–C_9 lactone is reacted with said aliphatic polyhydric alcohol or with said amino alcohol, said hydrocarbyl substituted acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin having a number average molecular weight of about 300 to about 10,000 and a C_4–C_{10} monounsaturated dicarboxylic acid material selected from the group consisting of acids, esters and anhydrides and containing an average of from about 0.7 to about 2.0 moles of dicarboxylic acid producing material per mole of said olefin polymer used in the reaction, said adduct having, on the average, a degree of polymerization of C_5–C_9 *lactone of less than about* 100.

4,954,277

LACTONE MODIFIED, ESTERIFIED OR AMINATED ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS AND COMPOSITIONS CONTAINING SAME

Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 916,217, Oct. 7, 1986, Pat. No. 4,866,141.
This application Aug. 31, 1989, Ser. No. 401,373
Int. Cl.[5] C10M *145/00, 149/00, 159/12*
U.S. Cl. 252—49.6 90 Claims

1. A C_5–C_9 lactone derived material useful as an oil additive and formed by (1) simultaneously reacting at a temperature of from about 100 to about 220° C. for a period of from about 1 to about 10 hours a hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material with a C_5–C_9 lactone and a member selected from the group consisting of (a) a polyamine having from about 2 to 60 total carbon atoms and from about 2 to about 12 nitrogen atoms, (b) an aliphatic polyhydric alcohol containing up to about 100 carbon atoms and from about 2 to about 10 hydroxyl groups, (c) an amino alcohol containing up to about 50 total carbon atoms, from 1 to about 3 nitrogen atoms and from 1 to about 15 hydroxyl groups, or (d) mixtures thereof, and (2) post-treating the reaction product formed in step (1) with a boron reactant, said hydrocarbyl substituted acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin having a number average molecular weight of about 300 to about 10,000 and a C_4–C_{10} monounsaturated dicarboxylic acid material selected from the group consisting of acids, esters and anhydrides and containing an average of about 0.7 to about 2.0 molar equivalents of dicarboxylic acid producing moieties per molar equivalent of said olefin polymer, said C_5–C_9 lactone having undergone ring opening polymerization such that the degree of polymerization of said C_5–C_9 lactone in the final C_5–C_9 lactone derived material is from about 0.2 to about 100.

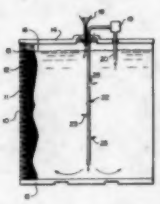
29. An oleaginous composition comprising (I) a lubricating oil and (II) a C_5–C_9 lactone derived material which has been prepared by first simultaneously reacting at a temperature of from about 100° to about 220° C. for a period of from about 1 to about 20 hours (i) a C_5–C_9 lactone, with (ii) a member selected from the group consisting of (a) a polyamine having from about 2 to about 60 total carbon atoms and from about 2 to about 12 nitrogen atoms, (b) an aliphatic polyhydric alcohol containing up to about 100 total carbon atoms and from about 2 to about 10 hydroxyl groups, and (c) an amino alcohol containing up to about 50 total carbon atoms, from 1 to about 3 nitrogen atoms and from 1 to 15 hydroxyl groups, and (d) mixtures of (a), (b) and (c), and with (iii) a hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material, and then post-treating the product obtained by reacting (i), (ii) and (iii) with a boron reactant; said hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin having a number average molecular weight of from about 300 to about 10,000 with a C_4–C_{10} monounsaturated dicarboxylic acid material and containing an average of from about 0.7 to about 2.0 dicarboxylic acid producing moieties per molecule of said olefin polymer, said C_5–C_9 lactone having undergone ring opening polymerization such that the degree of polymerization of said lactone in said final lactone derived material is from about 0.2 to about 100.

4,954,278

EUTECTIC COMPOSITION FOR COOLNESS STORAGE

Calvin D. MacCracken, Englewood, N.J., and Maria Telkes, North Miami, Fla., assignors to Calmac Manufacturing Corp., Englewood, N.J.

Filed May 8, 1989, Ser. No. 348,965
Int. Cl.[5] C09K *5/06*
U.S. Cl. 252—70 10 Claims



1. A eutectic composition consisting essentially of approximately 3.3% to approximately 4.3% by weight of sodium sulfate, approximately 0.5% to approximately 1.0% by weight of sodium tetraborate decahydrate, and the balance water.

4,954,279

AIRCRAFT DE-ICING AND ANTI-ICING COMPOSITION

Frank Ma, St. Leonard, and Daniel Comeau, Lachenaie, both of Canada, assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 142,335, Dec. 29, 1987, abandoned, which is a continuation of Ser. No. 907,258, Sep. 15, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 153,212
Claims priority, application Canada, Aug. 28, 1986, 517026
Int. Cl.[5] C09K *3/18*
U.S. Cl. 252—70 14 Claims

1. A de-icer and anti-icing composition comprising a microemulsion having a continuous phase and a discontinuous phase, said continuous phase comprising:

(a) from 5% to 85% by weight based on the weight of the total composition of a glycol selected from the group

consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, glycerol and mixtures thereof, and

(b) from 5% to 95% by weight of water based on the weight of the total composition;

said discontinuous phase comprising: up to 5.0% by weight based on the total weight of the composition of a water insoluble oil, the oil comprises at least one substantially water-insoluble, partially polar compound in an amount of from 0.1% to 2.5% by weight based on the weight of the total composition, and the remainder of the composition comprising:

(c) from 0.05% to 10.0% by weight based on the weight of the total composition of a thickening agent selected from the group consisting of natural and artificial gums, cellulose ethers, carboxymethylcellulose and hydroxyethylcellulose,

(d) an emulsifier selected from the group consisting of anionic surfactants and non-ionic surfactants and mixtures thereof, said emulsifier being present in an amount of from 0.1 times to 100 times the concentration of the water insoluble oil, and

(e) from 0.1% to 2.5% by weight of alkanolamines based on the weight of the total composition;

said total composition having a pH of from 6 to 10.

4,954,280

MACHINE DISHWASHING COMPOSITION

David L. Elliott, Hawthorne; Steven P. Christiano, Maplewood, both of N.J.; David J. Lang, Ossining, N.Y., and Rosemary M. Sisco, Hackensack, N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 161,228, Feb. 17, 1988, abandoned, which is a continuation of Ser. No. 62,521, Jun. 12, 1987, abandoned. This application Jun. 2, 1988, Ser. No. 202,087

Int. Cl.[5] C11D *7/36, 7/56, 17/00*

U.S. Cl. 252—90 **13 Claims**

1. An aqueous based fluid automatic dishwashing composition comprising:

(a) a thickening system comprising a synthetic water-soluble polymer, a swellable clay, and a soluble ro solubilized multivalent cation,

(b) a sufficient level of a source of available chlorine to produce at least about 0.5% thereof;

(c) a sufficient amount of an alkaline source to produce a pH of at least about 10.5; and

(d) a builder;

said composition being characterized by exhibiting thixotropic behavior, by having a yield point of about 30 to 100 pascals at 20° C., and by having an available chlorine level of at least about 0.5% by weight after about six weeks storage at 25° C.

4,954,281

SOAP COMPOSITIONS OF ENHANCED ANTIMICROBIAL EFFECTIVENESS

Carol M. Resch, Rutherford, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 199,568, May 27, 1988, Pat. No. 4,832,861. This application Mar. 14, 1989, Ser. No. 322,858

Int. Cl.[5] C11D *9/44, 9/50/17/00*

U.S. Cl. 252—107 **6 Claims**

1. A cleaning composition comprising:

(i) a C_{12}–C_{22} fatty acid salt;

(ii) a non-soap anionic surface active agent which is a C_{10}–C_{22} alkyl glycerol ether sulfonate; and

(iii) 2,4,4'-trichloro-2'-hydroxy diphenyl ether in an amount effective to reduce body odor, the ratio of fatty acid salt to surface active agent being from 4:1 to 1:0.98.

4,954,282

ACYL ISETHIONATE SKIN CLEANSING COMPOSITIONS

Karla J. Rys, Little Ferry; Alan P. Greene, Flemington; Frederick S. Osmer, Parsippany, all of N.J., and Joseph J. Podgorsky, Slate Hill, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 19, 1989, Ser. No. 340,185

Int. Cl.[5] C11D *9/32, 1/28*

U.S. Cl. 252—117 **4 Claims**

1. A skin cleansing composition comprising:

(i) acyl esters of isethionic acid salts, said esters being C_{16}–C_{18} acyl isethionates and having no more than 25% C_{14} or lower acyl groups; and

(ii) at least one co-active surfactant which is an amido sulfosuccinate;

wherein the weight ratio of said acyl esters to co-active ranges from about 20:1 to about 1:1, and soap is present in an amount from 0 to 10% by weight of the composition.

4,954,283

POLYETHYLENE GLYCOL ETHER LOW TEMPERATURE FOAM SUPPRESSING AGENTS IN LOW-FOAM CLEANING AGENTS

Karl H. Schmid, Mettmann; Alfred Meffert, Monheim; Gilbert Schenker, Erkrath; Adolf Asbeck, Duesseldorf, and Rolf Scharf, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 11, 1989, Ser. No. 295,872

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1988, 3800493

Int. Cl.[5] C11D *3/075, 1/72*

U.S. Cl. 252—135 **22 Claims**

1. A low foam cleaning composition which comprises:

a foam suppressing amount of at least one polyethyleneglycol ether of the formula:

$$R_1O\text{—}(CH_2CH_2O)_n\text{—}R_2 \quad (I)$$

wherein,

R_1 is a straight-chain or branched alkyl- or alkenyl radical having from 20 to 28 carbon atoms,

R_2 is an alkyl radical having from 4 to 8 carbon atoms and

n is an integer from about 6 to about 20 ; and at least one composition selected from the group consisting of nonionic surfactants, anionic surfactants, alkali metal hydroxide, builders, complexing agents, alkali metal phosphates, alkali metal silicates, alkali metal borates, alkali metal carbonates, polyacrylates, phosphonic acid and organic solvents.

4,954,284

AZEOTROPE-LIKE COMPOSITIONS OF DICHLORO-TRIFLUOROETHANE AND ETHYLENE OXIDE

James A. Batt, Depew; Robert G. Richard, Cheektowaga; Ian R. Shankland, and David P. Wilson, both of Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 251,729, Oct. 3, 1988, abandoned. This application Aug. 30, 1989, Ser. No. 400,607

Int. Cl.[5] C11D *7/30, 7/50*

U.S. Cl. 252—170 **17 Claims**

1. Azeotrope-like compositions consisting essentially from about 11 weight percent to about 3 weight percent ethylene oxide and from about 89 weight percent to about 97 weight percent dichlorotrifluoroethane selected from the group with of 1,1-dichloro-2,2,2-trifluoroethane and 1,2-dichloro-1,2,2-trifluoroethane, or mixtures thereof, which compositions with 1,1-dichloro2,2,2-trifluoroethane boil at about 28.8° C. at 744 mm Hg, which compositions with 1,2-dichloro-1,2,2,-trifluoroethane boil at about 29.5° C. at 741 mm Hg and which compositions containing a mixture of 1,1-dichloro-2,2,2-tri-

fluoroethane and 1,2-dichloro-1,2,2-trifluoroethane boil at about 29.15° C. at 742.5 mm Hg.

4,954,285

PERFUME, PARTICLES, ESPECIALLY FOR USE IN DRYER RELEASED FABRIC SOFTENING/ANTISTATIC AGENTS

Thomas J. Wierenga, Cincinnati; Joseph M. Ladd, Jr., Cleves; Russell J. Merz, Hamilton, and Alyce E. Nicholson, Morrow, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 164,678, Mar. 7, 1988, abandoned. This application Feb. 7, 1989, Ser. No. 306,334

Int. Cl.[5] C11D *13/46*

U.S. Cl. 252—174.11 24 Claims

1. A dry, flowable silica particle having a particle size of from about 0.001 micron to about 15 microns and having a perfume composition suitable for use in a fabric conditioning process adsorbed onto said silica particle, the ratio of said perfume composition to the silica particle being from about 0.001:1 to about 6:1 and there being no more than about 10% based on the weight of the silica and the perfume of other organic materials present.

4,954,286

FABRIC PRETREATMENT CLEANING COMPOSITIONS

Ralph R. Sepulveda, Suffern, N.Y., and Jesse L. Lynn, Jr., Oradell, N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 14, 1988, Ser. No. 181,287

Int. Cl.[5] C11D *1/835, 1/72*

U.S. Cl. 252—174.22 15 Claims

1. An aqueous, clear homogeneous liquid composition comprising:

(a) from 1 to 20% of a mixture of surfactants comprising:

(i) a first nonionic surfactant having an HLB from about 7.9 to less than 10, said first nonionic surfactant being an ethoxylated C_{12}–C_{15} alkanol; and

(ii) a second nonionic surfactant having an HLB of at least 12 said second nonionic surfactant being an ethoxylated C_{12}–C_{15} alkanol;

the ratio of (i) to (ii) being 2:1 to 1:2;

(b) from 1 to 30% of a hydrocarbon solvent; and

(c) from 1 to 20% of an alkanolamine salt of a C_{12}–C_{22} fatty acid.

4,954,287

CHLOROFLUOROHYDROCARBON COMPOSITIONS

Neil Winterton, Pantasaph, and John G. Carey, Warrington, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Filed Apr. 1, 1988, Ser. No. 176,763

Claims priority, application United Kingdom, Apr. 3, 1987, 8707962

Int. Cl.[5] C09K *3/00*; C08G *18/14*; C07C *17/42*

U.S. Cl. 252—182.26 9 Claims

1. A chlorofluorohydrocarbon composition comprising trichlorofluoromethane or 1,1,2-trichloro-1,2,2-trifluoroethane stabilized against reaction with active hydrogen compounds by incorporating therein a stabilising amount of ortho(isopropenyl) aniline.

3. A mixture which is reactive with a polyisocyanate to yield polyurethane foam comprising one or more active hydrogen compounds and trichlorofluoromethane or 1,1,2-trichloro-1,2,2-trifluoroethane having incorporated therein a stabilising amount of a stabilizer selected from amylene, ortho-(isopropenyl)aniline and diisobutylene.

4,954,288

SIDE CHAIN LIQUID CRYSTALLINE POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

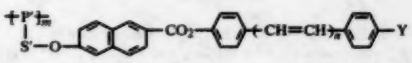
Anthony J. East, Morris, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 280,096, Dec. 5, 1988, Pat. No. 4,913,836. This application Nov. 14, 1989, Ser. No. 435,759

Int. Cl.[5] C09K *19/52*

U.S. Cl. 252—299.01 9 Claims

1. A thermotropic liquid crystalline polymer which is characterized by a recurring monomeric unit corresponding to the formula:



where P′ is a polyvinyl polymer main chain unit, m is an integer with a value of at least 5, n is an integer with a value of zero or one, S′ is a flexible spacer group having a linear chain length of between about 2–20 atoms, and Y is an electron-withdrawing substituent, and where the recurring monomeric unit comprises at least about 50 weight percent of the polymer, and the polymer has a glass transition temperature between about 0°–120° C.

4,954,289

AZEOTROPES OF HYDROGEN-CONTAINING HALOCARBONS WITH BUTANES

Philip L. Bartlett; Joseph A. Creazzo, both of Wilmington, and Robert A. Gorski, Newark, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 12, 1989, Ser. No. 366,370

Int. Cl.[5] C09K *3/00, 3/30*

U.S. Cl. 252—305 10 Claims

1. An azeotropic composition consisting essentially of a member of the group consisting of 84.6 to 88.2 weight percent 1-chloro-1,2,2,2tetrafluoroethane and 11.8 to 15.4 weight percent n-butane; 68.5 to 76.5 weight percent 1-chloro-1,2,2,2-tetrafluoroethane and 23.5 to 31.5 weight percent isobutane; 74.6 to 83.2 weight percent 1-chloro-1,1-difluoroethane and 16.8 to 25.4 weight percent n-butane; and 58.6 to 62.4 weight percent 1-chloro-1,1-difluoroethane and 37.6 to 41.4 weight percent isobutane.

4,954,290

AZEOTROPES OF A HYDROGEN-CONTAINING HALOCARBON WITH PENTANES

Philip L. Bartlett; Joseph A. Creazzo, both of Wilmington, and Robert A. Gorski, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 12, 1989, Ser. No. 366,369

Int. Cl.[5] C09K *3/30, 3/00*

U.S. Cl. 252—305 5 Claims

1. An azeotropic composition consisting essentially of a member of the group consisting of 83.4 to 90.6 member percent 1,1-dichloro-2,2,2trifluoroethane and 9.4 to 16.6 weight percent n-pentane; and 65.2 to 72.2 weight percent 1,1-dichloro-2,2,2-trifluoroethane and 27.8 to 34.8 weight percent isopentane.

4,954,291

CRYSTALLINE RESIN COMPOSITIONS

Toshiaki Kobayashi, Nara, and Keiko Motomatsu, Oomagari, both of Japan, assignors to New Japan Chemical Co., Ltd., Kyoto, Japan

Filed Sep. 6, 1989, Ser. No. 403,395

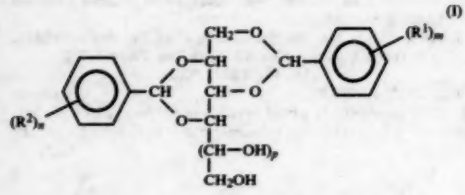
Claims priority, application Japan, Sep. 16, 1988, 63-232896

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—315.1 4 Claims

1. A nucleating agent composition which comprises

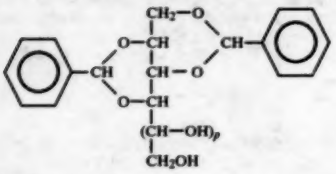
(a) at least one of the compounds represented by the formula



(I)

wherein R^1 is methyl, R^2 is hydrogen atom, and m is 2 or 3; or R^1 is hydrogen atom, R^2 is methyl, and n is 2 or 3; and p is 0 or 1,

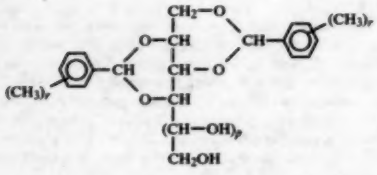
(b) at least one of the compounds represented by the formula



(II)

wherein p is 0 or 1, and

(c) at least one of the compounds of the formula



(III)

wherein r is the same and is an integer of 2 or 3, and p is 0 or 1, the proportions of the components (a), (b) and (c) to be combined being such that Z calculated according to the equation

$$Z=A/(A+B+C)$$

wherein A, B and C are each the amount by weight of the components (a), (b) and (c), respectively, is within the range of about 0.3 to about 0.8.

4,954,292

DETERGENT COMPOSITION CONTAINING PVP AND PROCESS OF USING SAME

Michael Hull, Helsby, and Reginald V. Scowen, Wirral, both of United Kingdom, assignors to Lever Brothers Co., New York, N.Y.

Filed Sep. 14, 1987, Ser. No. 97,009

Claims priority, application United Kingdom, Oct. 1, 1986, 8623586; Oct. 20, 1986, 8625102

Int. Cl.[5] C11D *1/83, 3/28, 3/37*

U.S. Cl. 252—542 **5 Claims**

1. A detergent composition for washing soiled fabrics comprising 5 to 90% by weight of an inorganic detergency builder; 5 to 40% by weight of an anionic detergent active material; polyvinyl pyrrolidone having a molecular weight of from about 5,000 to about 100,000; and an alkoxylated nonionic material or a mixture thereof, wherein the HLB value of the nonionic material or its mixture is not more than 10.5; the ratio of the polyvinyl pyrrolidone to the nonionic material is within the range from 8:2 to 2:8 and the total level of the polyvinyl pyrrolidone and the nonionic material is within the range from 0.1 to 5% by weight.

4,954,293

SEPARATION OF THORIUM AND RARE EARTH VALUES FROM FLUORIDE CONCENTRATES THEREOF

Francinet Cailly, and Frederic Fabre, both of Paris, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Nov. 28, 1988, Ser. No. 276,665

Claims priority, application France, Nov. 27, 1987, 87 16452

Int. Cl.[5] C01F *15/00, 17/00*

U.S. Cl. 252—625 **16 Claims**

1. A process for the separation of thorium and rare earth values from a fluoride concentrate thereof, comprising decomposing such concentrate with aqueous sodium hydroxide under conditions such that the amount of sodium hydroxide is at least 1.4 times the stoichiometric amount and the initial sodium hydroxide/water ratio in the medium of decomposition ranges from 1% to 30% by weight, whereby a precipitate of thorium hydroxide and rare earth hydroxides is produced, together with a solution of sodium fluoride, and then separating the NaF solution therefrom.

4,954,294

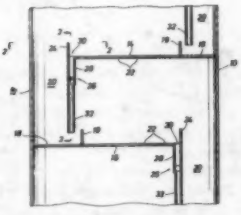
VAPOR/LIQUID CONTACT APPARATUS

Robert P. Bannon, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 11, 1989, Ser. No. 392,314

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—114.1 **4 Claims**



1. Apparatus for sealing vapor/liquid contacting trays on startup in a downcomer-equipped vapor/liquid contactor, said apparatus comprising:

at least one downcomer-equipped upright vapor/liquid contacting column, comprising a series of gas/liquid contacting trays, at least some of said trays having associated therewith a weir to maintain a liquid level thereon, a downcomer whereby liquid may flow down to the next lower tray and a seal pan positioned underneath said downcomer for providing a liquid seal between successive trays in said series; and

collecting means, provided on at least one said contacting tray having said weir, said downcomer and said seal pan associated therewith, and said collecting means having an upper part disposed at an elevation substantially at the elevation of the tray it is disposed on, and said upper part of said collecting means being dimensioned to provide sufficient liquid depth to permit flow of liquid and preclude gas flow through a lower part of said collecting means during start-up conditions; said collecting means having a lower part disposed to provide liquid to said seal pan, said collecting means being dimensioned for collecting liquid from said tray so that no appreciable level has to build up on said tray before it flows into and through said

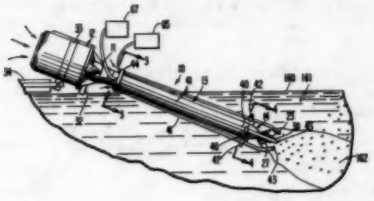
lower part into said seal pan which is disposed underneath said downcomer.

4,954,295

PROPELLER AERATOR WITH PERIPHERAL INJECTION OF FLUID AND METHOD OF USING THE AERATOR

Joseph A. Durda, Wazatta, Minn., assignor to Aeration Industries, Inc., Chaska, Minn.

Filed Jan. 12, 1989, Ser. No. 297,062
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—16 **14 Claims**



1. A propeller type aeration apparatus for inducing the flow of fluids into a liquid being treated by the rotation of a propeller in the liquid comprising:

an outer housing having a hollow interior, opposite first and second ends, and a longitudinal dimension extending between the two ends;

a drive shaft supported for rotary motion about its axis within the hollow interior of said outer housing;

motor means connected to a first end of said drive shaft for rotating said drive shaft;

a propeller attached to a second end of said drive shaft whereby the rotation of said drive shaft rotates said propeller and induces a flow of the liquid in which the propeller is disposed;

a first fluid outlet extending through the center of said propeller; and

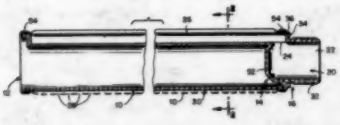
at least one elongate conduit attached to an outer surface of said outer housing, one end of said conduit having a second fluid outlet located adjacent to and downstream of the periphery of said propeller and in the path of the flow of the liquid caused by the propeller, and a second end of the conduit being in communication with a fluid to be injected into the fluid.

4,954,296

GAS INJECTION EQUIPMENT

Wilfried Ott, Langenhagen, Fed. Rep. of Germany, assignor to Rita Ott, Langenhagen, Fed. Rep. of Germany

Filed Jun. 5, 1989, Ser. No. 361,135
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, 3819305
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—122 **8 Claims**



1. A gas injection device for introducing a gas into a liquid, especially air into sewage, comprising:

a tubular nozzle having a first end and a second end; said nozzle being open at the first end and being closed at the second end;

a partition for closing said second end of said nozzle;

a fastening connection at the second end for securing the nozzle to a supply of gas;

a membrane having perforations and said membrane placed around the outside of the nozzle;

a gas-supply channel that opens in the vicinity of the membrane; said gas-supply channel comprising a chamber that is coaxial with the second end of the nozzle and is demarcated by said partition, and said gas-supply channel also comprising a radial outlet that is adjacent to the chamber and extends through the wall of the nozzle;

said chamber having a bore, one end of which is closed off by the partition; and

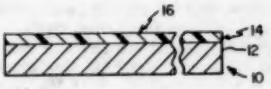
said nozzle and said fastening connection being in one piece.

4,954,297

METHOD AND APAPRATUS FOR FORMING A MATTE FINISH ON RESIN-COATED WEBS OR SHEETS

Jack Beery, Centerville, and Charles W. Joiner, Jr., Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 5, 1988, Ser. No. 279,683
Int. Cl.[5] B29C *59/04*; B29D *11/00*
U.S. Cl. 264—1.3 **2 Claims**



1. The method of forming a matte finish on the resin surface only of resin coated web and paper material, comprising the steps of:

providing a resin casting surface in the form of a flexible endless belt,

heating said belt to a temperature sufficient to coalesce said resin coating at said casting surface,:

applying the resin coated surface of such material against said casting surface in which said casting surface has a non-locking diffraction grating configuration formed with a series of lands separated by grooves, the sides of said grooves forming a valley which is narrower at the bottom than at the top adjacent the lands and free of resin-trapping overhang portions and in which the pitch of said grooves is randomized and is approximately between 1.6 and 2.6 microns,

applying pressure to said material while so cast on said heated casting surface to coalesce the resin coating,

cooling said belt to cool said material, and

removing said cooled material from said casting surface.

2. In a belt-type glosser for applying a matte finish to resin-coated sheets by the application of heat and pressure to the resin coated surface of the sheet while it is molded against a casting surface of heated flexible endless belt, the improvement comprising:

means on said belt casting surface defining a grooved pattern in the form of a diffraction grating, in which a plurality of closely spaced individual grooves in the belt surface are configured with walls which are narrower at the bottoms of the grooves than at the tops thereof to provide a non-locking matte surface configuration on the resin surface only of said sheets, said grooves having a randomized pitch of between 1.6 to 2.6 microns.

4,954,298

METHOD FOR PRODUCING MICROCAPSULE

Masaki Yamamoto, Osaka; Shigeyuki Takada, Suita, and Yasuaki Ogawa, Ibaraki, all, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 826,968, Feb. 7, 1986, abandoned. This application Sep. 23, 1988, Ser. No. 249,198

Claims priority, application Japan, Feb. 7, 1985, 60-22978; Nov. 27, 1985, 60-267977

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[5] A61K *9/50, 9/52, 9/66;* B01J *13/02*

U.S. Cl. 264—4.6 20 Claims

1. A method of producing sustained-release microcapsules for injection containing a water-soluble drug, which comprises preparing a W/O emulsion composed of a water-soluble drug-containing solution as the inner aqueous phase and a biodegradable polymer-containing solution as the oil phase, adjusting the viscosity of the W/O emulsion used in preparing the W/O/W emulsion to from about 150 to about 10,000 centipoises by the procedure of increasing the polymer concentration in the oil phase; adjusting the ratio of the aqueous phase to the oil phase; adjusting the temperature of said W/O emulsion; adjusting the temperature of the external aqueous phase; adjusting the temperature of the W/O emulsion with a line heater or cooler or the like in infusing the W/O emulsion into the external aqueous phase; or carrying out the above procedures in combination, dispersing said emulsion in an aqueous phase and subjecting the resulting W/O/W emulsion to an in-water drying to form microcapsules.

4,954,299

STRUCTURES OF PLASTICS MATERIAL

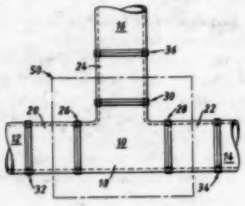
John M. Greig, 24 Chevington Grove, Whitley Bay, Tyne & Wear NE25 9UG, England, and Jeremy A. Bowman, 62 Leas Drive, Iver, Buckinghamshire, SLO 9RD, England

Continuation of Ser. No. 84,207, Aug. 12, 1987, abandoned. This application Jun. 28, 1989, Ser. No. 373,641

Claims priority, application United Kingdom, Aug. 18, 1986, 8620071

Int. Cl.[5] B29C *71/02, 71/04, 65/02*

U.S. Cl. 264—22 5 Claims



1. A method of making a relatively large multi-component pipe fitting of polymeric plastics material which fitting is capable of being joined to a pipe of polymeric plastics material in the field by fusion, said fitting comprising a self-supporting hollow body moulded rotationally from rotational moulding grade polymeric plastics material having a relatively high melt flow index of 1.5 or greater and formed with at least one annular body end portion having a relatively large diameter, said fitting further comprising for each said body end portion a corresponding self-supporting hollow pup formed by extrusion from extrusion grade polymeric plastics material having a relatively low melt flow index of 1.0 or less, said pup having at opposite ends thereof first and second annular pup end portions having an outside diameter and a wall thickness the match the annular body end portion to which it is joined, said method comprising the steps of:

(i) forming an annular joint between each said body end portion and said first pup end portion of said corresponding pup under factory conditions by fusion thus forming a multi-component structure, said fusion step comprising heating the body to a first relatively higher temperature nd the pup end to a second relatively lower temperature, said temperatures being chosen to compensate for the difference in melt flow indexes;

(ii) shielding each said second pup end portion against the effect of gamma radiation, leaving the remainder of said structure unshielded;

(iii) exposing the whole of said remainder of said structure, including each said joint, to gamma radiation to produce cross-linking within said remainder to thereby enhance the resistance thereof to slow crack growth; said second pup end portion affording capability for said pup to be joined to said pipe in the field by fusion as aforesaid.

4,954,300

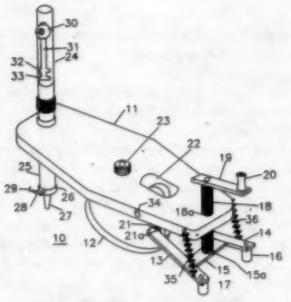
GLASS REPAIR METHOD AND APPARATUS

Jimmy R. Dotson, Balch Springs, Tex., assignor to John E. Vandigriff, Lewisville, Tex.

Filed Jun. 14, 1989, Ser. No. 366,757

Int. Cl.[5] B32B *35/00*

U.S. Cl. 264—36 16 Claims



1. A method for repairing chips and cracks in windshields by injecting a repair chemical into the chip or crack that cures to a clear state, comprising the steps of:

affixing an apparatus holding an injector mechanism firmly against the windshield such that an end of the injector covers the chip or crack;

filling the injector with the repair chemical;

heating the repair chemical to a temperature from about 75° F. to about 150° F. prior to injecting it into the chip or crack;

injecting the repair chemical into the chip or crack; and

maintaining pressure on the repair chemical for a period of time to ensure that repair chemical has completely filed the chip or crack.

4,954,301

TRANSFER MOLDING PROCESS AND AN APPARATUS FOR THE SAME

Junichi Saeki; Aizo Kaneda, both of Yokohama, and Kunihiko Nishi, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 153,608, Feb. 8, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,505

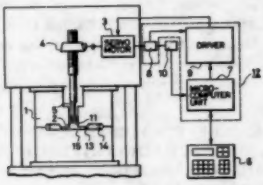
Claims priority, application Japan, Feb. 25, 1987, 62-40169

Int. Cl.[5] B29C *45/2, 45/76*

U.S. Cl. 264—40.1 17 Claims

1. A transfer molding process for sealing an electronic device in a resin by driving a plunger downward in a pot to inject molten resin into a cavity of a mold, characterized in that a rotary motion of an output shaft of an electric motor is trans-

mitted to the plunger to drive the plunger downward after said rotary motion is converted into a linear motion, that the electric motor is controlled by a control means, the control means having stored therein primary and secondary maximum currents as upper limits of current to be supplied to the electric motor, and that the current supplied to the electric motor is



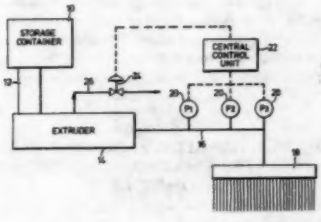
changed from the primary maximum current to the secondary maximum current, at a predetermined displacement of the plunger, before the cavity of the mold is filled completely with the molten resin, the changing from the primary maximum current to the secondary maximum current being controlled by a displacement detecting means detecting displacement of the plunger.

4,954,302

PROCESS FOR CONTROLLING QUALITY OF YARNS

Ernest K. A. Marchildon; Douglas W. Muzyka, and Michel M. Dumoulin, all of Kingston, Canada, assignors to Du Pont Canada, Inc., Mississauga, Canada

Filed Aug. 31, 1988, Ser. No. 238,507
Int. Cl.[5] D01F *1/02, 6/58*
U.S. Cl. 264—40.1 **4 Claims**



1. A process for controlling the relative viscosity of synthetic yarns made from polymer during production thereof by controlling the water content of the polymer comprising the steps of:

taking at least three pressure measurements at at least three spaced locations in a transfer line for carrying polymer between a melting zone and a spinneret;

measuring temperature and throughput of polymer in said transfer line;

calculating an estimated relative viscosity of yarn produced by employing the equation:

$$RV = \left[\frac{(AdP1 + BdP2 + C)}{(THPT * Tcorr)} \right] (1/3.5)$$

wherein:

A, B and C=constants

RV=throughput of polymer

THPT=P1 - P2

dP1=P3 - P2

P1, P2, P3=pressure measurements taken

$Tcorr$ = temperature correction factor

= $\exp(-Ea/RT)$

wherein:

Ea=activation energy for viscosity

R=ideal gas constant

T=absolute temperature of process; and

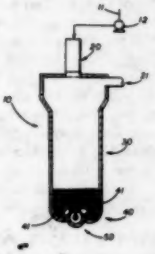
adjusting the water content of the polymer in response to deviations in the estimated relative viscosity of said yarn from a desired relative viscosity of said yarn.

4,954,303

APPARATUS AND PROCESS FOR DEVOLATILIZATION OF HIGH VISCOSITY POLYMERS

Eugene R. Moore, and Tom E. Wessel, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 10, 1989, Ser. No. 308,720
Int. Cl.[5] B29C *47/00, 47/76*
U.S. Cl. 264—101 **40 Claims**



1. An apparatus for devolatilizing polymeric materials containing volatile constituents comprising, in combination:

a vertically disposed heating zone, said heating zone having an inlet means for receiving a stream of polymeric material, means for heating polymeric material within said zone and an outlet means for discharging polymer from said heating zone;

a vertically disposed vacuum zone having an upper half and a bottom half, the upper half of said vacuum zone being in open communication with said heating zone and being adapted to receive heated polymer from said heating zone, said upper half of said vacuum zone having a means for withdrawing volatile constituents from said vacuum zone;

a vertically disposed low shear mixing means located in the bottom half of said vacuum zone and being adapted to receive and agitate polymeric material within said vacuum zone; and

a vertically disposed discharge means, said discharge means being in open communication with said low shear mixing means and being adapted to receive devolatilized polymeric material from said low shear mixing means and to discharge devolatilized material from said apparatus.

21. A method for devolatilizing polymeric material containing volatile constituents comprising:

introducing a stream of polymeric material containing volatile impurities into a vertically disposed heating zone;

raising the temperature of said stream of polymeric material during its residence in said heating zone;

gravitationally passing said heated stream of polymeric material to a vertically disposed vacuum zone having an upper half and a lower half, and including a volatile constituent withdrawal means located in said upper half of said vacuum zone for withdrawing volatile constituents from said vacuum zone and a vertically disposed low shear mixing means located in said bottom half of said

vacuum zone and mixing under conditions of low shear said polymeric material in said vacuum zone to separate volatile constituents from said polymeric material during its residence in said devolatilizing zone;

withdrawing separated volatile constituents from said vacuum zone through said volatile constituent withdrawal means; and

discharging said devolatilized polymeric material from said vacuum zone.

4,954,304

PROCESS FOR PRODUCING PREPREG AND LAMINATED SHEET

Toshikazu Ohtake; Munekazu Hayashi; Satoshi Idemura; Kazumi Ohi, and Yuji Kunitake, all of Chiba, Japan, assignors to Dainippon Ink and Chemical, Inc., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,144

Claims priority, application Japan, Apr. 4, 1988, 63-81329; Sep. 12, 1988, 63-227784; Sep. 26, 1988, 63-240462

Int. Cl.[5] B29C *67/12*

U.S. Cl. 264—137 **19 Claims**

1. A process for producing a prepreg comprising impregnating a fibrous base with an impregnating resin composition consisting essentially of (A_1) a room temperature liquid epoxy resin, (A_2) an epoxy resin curing agent having an average epoxy equivalent of from 100 to 400, a resin containing a polymerizable unsaturated group, (B_2) a room temperature liquid polymerizable vinyl monomer having 4 to 18 carbon atoms, (B_3) a polymerizable initiator and containing no solvent other than said polymerizable vinyl monomer (B_2), to obtain an impregnated base, and then removing the polymerizable vinyl monomer present in said impregnated base and converting the resin components to the B-stage.

4,954,305

PROCESS AND APPARATUS FOR PRODUCING PLASTIC BRISTLE ARTICLES

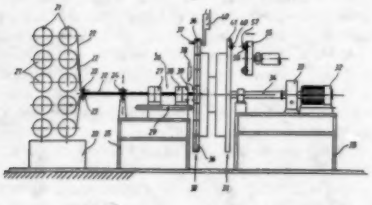
Georg Weihrauch, Wald-Michelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Wald-Michelbach, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,905

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718811

Int. Cl.[5] B29C *65/02*; B29L *31/42*

U.S. Cl. 264—157 **10 Claims**



1. Process for the production of plastic bristle articles comprising a bristle carrier and bristles, the process comprising the steps of, on a first movement path in respective stations, clamping the bristles in a number and arrangement corresponding to the bristle occupancy of the finished bristle article by means of clamping devices which move the bristles, and melting the clamped bristles at the end thereof to be joined to the bristle carrier, and concurrently on a second movement path in respective station, holding the bristle carriers by means of holders which are moved with the bristle carriers, and melting the bristle carriers at least zonely at their side for receiving the bristles, the bristles and bristle carriers being timed between the stations on the respective movement paths and brought together in the still plastic state and fused, wherein in said step of bringing the bristles and bristle carriers together one of the clamping devices with the bristles and the holders with the bristle carriers are moved from one movement path to the other at a transfer station at the start of a transfer and cooling section, the brought together clamped bristles and held bristle carriers with their respective clamping devices and holders are moved together along said other movement path in said transfer and cooling section, and at the end of the transfer and cooling section the bristles are detached from the clamping devices and said one of the clamping devices and the holders are returned to their respective movement path.

4,954,306

METHOD AND DEVICE FOR THE MANUFACTURE OF A SHEET OF POLYVINYLBUTYRAL

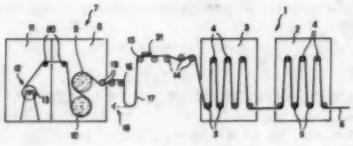
Bernard Jamet, Compiegne, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Oct. 26, 1988, Ser. No. 262,783

Claims priority, application France, Oct. 26, 1987, 87 14764

Int. Cl.[5] B29C *47/88*

U.S. Cl. 264—210.2 **13 Claims**



1. A method for manufacturing a sheet of polyvinylbutyral to be used in laminated glazings, comprising extruding a sheet of polyvinylbutyral, subjecting said extruded sheet to a humid atmosphere at elevated temperature to relax said sheet by passing it through said atmosphere while stretching it between roller means, allowing the sheet to form a first free loop immediately before passing said sheet through cooling means, the cooling means fixing the properties of said sheet, and forming a roll of said sheet under tension on roller means.

4,954,307

METHOD FOR MANUFACTURING PLASTIC ENCAPSULATED ELECTRONIC SEMICONDUCTOR DEVICES

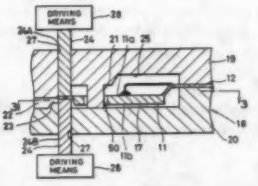
Takaaki Yokoyama, Niiza, Japan, assignor to Sanken Electric Co., Ltd., Saitama, Japan

Filed Dec. 28, 1988, Ser. No. 291,065

Claims priority, application Japan, Dec. 31, 1987, 62-336561

Int. Cl.[5] B29C *45/02, 45/14*

U.S. Cl. 264—272.15 **13 Claims**



1. A method for manufacturing plastic encapsulated electronic devices comprising the steps of:

a. preparing a lead frame assembly and a mold assembly, the lead frame assembly including a support pad and external leads at least one of which is connected to one end of the support pad, the support pad having a first main surface on which an electronic element or a printed circuit substrate is deposited, the mold assembly including a mold cavity

and a gate formed at a side surface of the mold cavity, the mold assembly having slidable means movable toward and away from the mold cavity in the vicinity of the side surface of the mold cavity;

b. disposing the lead frame assembly in the mold assembly so that the other end of the support pad is positioned opposed to the side surface of the mold cavity; then, clamping the external leads by the mold assembly, and clamping the support pad by the slidable means so that a second main surface of the support pad is positioned in spaced relation to a corresponding surface of the mold cavity so that the gate is partially covered by the slidable means;

c. injecting fluid plastic encapsulating material through the gate into the mold cavity until more than half volume of the mold cavity is filled with the fluid plastic encapsulating material;

d. moving the slidable means away from the support pad to fully open the gate;

e. further injecting plastic encapsulating material through the gate into the remainder of the mold cavity including the space formed by movement of the slidable means, thereby causing the plastic encapsulating material to encapsulate the entire surface of the support pad.

4,954,308

RESIN ENCAPSULATING METHOD

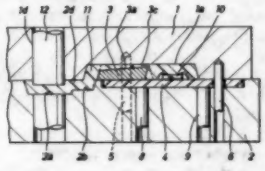
Isao Yabe, Tokorozawa; Katsuji Komatsu, Kawagoe, and Hiroyuki Kaneko, Hoya, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,227

Claims priority, application Japan, Mar. 4, 1988, 63-50738; Mar. 15, 1988, 63-59409

Int. Cl.[5] B29C *45/02, 45/14*

U.S. Cl. 264—272.17 **6 Claims**



1. A method of resin encapsulating an electronic part mounted on a flat resin circuit board having metallic wiring thereon, the method comprising the steps of:

sandwiching said circuit board between a first mold and a second mold so as to position said electronic part in a cavity formed by at least the first mold wherein said electronic part is disposed within said cavity;

selecting a gate plate having a gate groove formed on one surface thereof;

arranging said gate plate adjacent to said cavity on an intermediate portion of a surface of the circuit board, the intermediate portion being spaced from the edge of the circuit board;

orienting said gate plate such that said gate groove faces a surface of said mold opposite the surface on which said circuit board is disposed and forming a side gate between said first mold and said gate groove, thereby connecting said side gate to a side surface of said cavity at a position spaced from an upper surface of said circuit board; and

filling said cavity with resin through said side gate.

4,954,309

METHOD OF FORMING A POLYMERIC CASING WITH TEXTURED SURFACE

Mark W. McGlothlin, and Alice A. DePaul, both of San Diego, Calif., assignors to Apex Medical Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 148,788, Jan. 27, 1988, abandoned. This application Oct. 20, 1988, Ser. No. 260,157

Int. Cl.[5] B29C *41/00*

U.S. Cl. 264—307 **36 Claims**

1. A method for the manufacture of a polymeric casing of preselected shape having a lubricous surface, said method comprising:

(a) immersing a form of said preselected shape in a solution of a solid-polymer-forming material dissolved in a first liquid;

(b) withdrawing said form from said solution to retain a liquid film thereof on said form;

(c) contacting said film with a second liquid which is miscible in all proportions with said first liquid and in which said solid-polymer-forming material is substantially insoluble;

(d) converting said solid-polymer-forming material to a solid polymer film over said form with a matte surface; and

(e) removing said solid polymer film from said form.

4,954,310

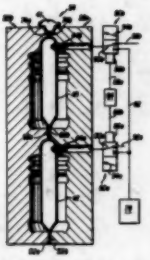
TANDEM MOLDING OF PLASTIC CONTAINERS

Jorn W. Andersen, Newburgh, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 106,306, Oct. 9, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 379,720

Int. Cl.[5] B29C *49/04, 49/36, 49/60, 49/78*

U.S. Cl. 264—520 **1 Claim**



1. A method for molding plastic containers in a tandem mold which method comprises:

a. Providing a plastic tubing parison that includes a first portion, and a second portion that has been extruded subsequent to said first portion and that is at a higher average temperature than said first portion;

b. simultaneously enclosing said first portion in a first container cavity of said mold and said second portion in a second container cavity of said mold;

c. pneumatically isolating said first portion of said parison from said second portion;

d. inserting a first blow needle into said first portion and inserting a second blow needle into said second portion;

e. communicating pressurized air to said first blow needle while isolating said pressurized air from said second blow needle, thereby forming a first container form said first portion;

f. cooling said second portion; and

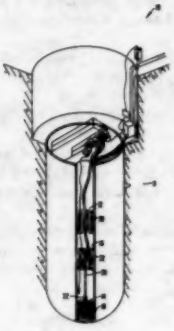
g. communicating pressurized air to said second blow needle, thereby forming a second container from said second portion subsequent to said cooling step.

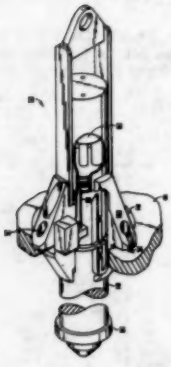
4,954,311

CONTROL ROD HOUSING ALIGNMENT

Robert C. Dixon, Morgan Hill; Gerald A. Deaver; James R. Punches, both of San Jose; Guy E. Singleton, Fremont; John G. Erbes, San Jose, and Henry P. Offer, Los Gatos, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jan. 10, 1989, Ser. No. 295,413
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—258 3 Claims





1. A process for measuring the vertical alignment between a hole in a core plate and the top of a corresponding control rod drive housing within a boiling water reactor including the steps of:

providing an alignment apparatus, said alignment apparatus including a lower end for fitting to the top of said control rod drive housing;

an upper end for fitting to the aperture in said core plate, and a leveling means attached to said alignment apparatus to read out the difference in angularity with respect to gravity, and alignment pin registering means for registering to the alignment pin on said core plate;

lowering said alignment device on a depending support through a lattice position in the top guide through said hole in said core plate down into registered contact with the top of said control rod drive housing;

registering said upper end to the sides of said hole in said core plate;

registering said alignment pin registering means to an alignment pin on said core plate to impart to said alignment device the required angularity; and

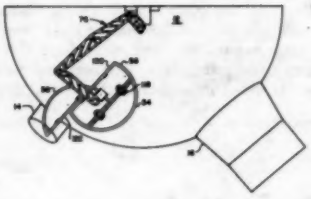
reading out the angle of said control rod drive housing with respect to the hole in said core plate through said leveling devices whereby the angularity of the top of said control rod drive housing with respect to the hole in said core plate can be determined.

4,954,312

REMOTELY INSTALLED STEAM GENERATOR NOZZLE DAM SYSTEM

Francis X. McDonald, Enfield; Eric M. Weisel, Windsor Locks, and Glen E. Schukei, South Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 15, 1988, Ser. No. 285,056
Int. Cl.[5] G21C *13/06*; B21D *53/00*
U.S. Cl. 376—260 10 Claims



3. A method for remotely installing a dam unit in a nozzle or a nuclear steam generator head, the head including a manway, comprising the steps of:

(a) mounting an articulated manipulator to an internal surface of the head, the manipulator having a free end which carries a jaw member;

(b) positioning the manipulator so that the jaw member is adjacent the manway and substantially on the manway axis;

(c) passing a first dam segment through the manway and attaching the jaw member to the first segment;

(d) positioning the manipulator so that the jaw member holds the first dam segment on one side of the manway axis;

(e) passing a second dam segment through the manway into engagement with the first dam segment to form a dam subassembly;

(f) translating the manipulator through the head until the dam subassembly is adjacent the nozzle;

(g) advancing the jaw member toward the nozzle until the cam subassembly is positioned substantially at the desired location of the dam unit with respect to the nozzle; and

(h) deploying the manipulator to install dam support structure between the dam subassembly and the steam generator, thereby forming an installed dam unit.

4,954,313

METHOD AND APPARATUS FOR FILLING HIGH DENSITY VIAS

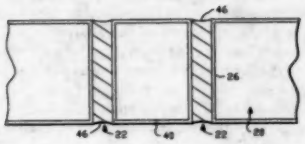
John F. Lynch, Half Moon Bay, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Feb. 3, 1989, Ser. No. 306,623
Int. Cl.[5] B22F *3/00, 7/00*
U.S. Cl. 419—9 19 Claims

1. A method for filling high density vias in a substrate, comprising the steps of:

(a) providing a metal paste on a first surface of the substrate;

(b) applying a vacuum to each via at the second surface of the substrate; and



(c) applying pressure to the metal paste on the first surface of the substrate concurrently with said step (b).

4,954,314

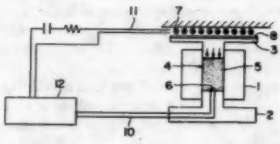
METHOD AND APPARATUS FOR MANUFACTURING SYNTHETIC PRODUCTS

Yukio Nishiyama; Junzo Fujioka, both of Akashi; Haruki Hino; Yuji Matsuzaki, both of Kobe; Masayuki Sakiyama, Ono, and Minoru Yokoyama, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Feb. 7, 1990, Ser. No. 476,544

Int. Cl.[5] B22F *3/00*

U.S. Cl. 419—45 **3 Claims**



1. A method of manufacturing synthetic products comprising the steps of:

mixing a plural number of types of material powders;

causing a self-exothermic reaction continuously inducing chemical reactions between the material powders caused by heat of reaction released when the mixed material powders synthesize; and

pressing the synthesized material at high temperature by utilizing an electromagnetic force just after the finish of the self-exothermic reaction.

4,954,315

METHOD FOR RECOVERY OF STERILIZING GAS

Sudhir R. Brahmbhatt, Macungie, Pa., assignor to MG Industries, Valley Forge, Pa.

Filed Feb. 3, 1988, Ser. No. 151,878

Int. Cl.[5] A61L *2/00*; F25J *3/00*

U.S. Cl. 422—31 **12 Claims**

4. A method for recovery of a sterilizing gas, the sterilizing gas including a sterilizing agent and a relatively inert diluent, the sterilizing gas having been discharged from a sterilizing chamber, the method comprising the steps of:

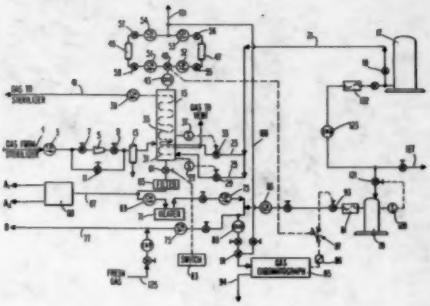
(a) cooling a sterilizing gas, to a temperature sufficient to liquefy a sterilizing agent and a diluent gas so as to produce a liquid mixture of the sterilizing agent and the diluent, but not sufficient to liquefy other gaseous impurities mixed with the sterilizing gas,

(b) venting the gaseous impurities remaining after the cooling step,

(c) vaporizing the mixture of sterilizing agent and diluent,

(d) adjusting the proportion of sterilizing agent in the vaporized mixture by adding more sterilizing agent, and

(e) returning the vaporized mixture to the sterilizing chamber,



wherein all steps of the method are performed repeatedly without adding additional diluent only.

4,954,316

STABLE, ACTIVE CHLORINE CONTAINING ANTI-MICROBIAL COMPOSITIONS

Alfred R. Globus, 26-53 210th St., Bayside, N.Y. 11365

Continuation-in-part of Ser. No. 116,203, Oct. 3, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 288,241

Int. Cl.[5] A61L *2/18/00*

U.S. Cl. 422—37 **11 Claims**

1. An antimicrobial composition, in the form of a dry free flowing powder comprising

(a) a chlorinated isocyanuric acid or its salt,

(b) ammonium perfluoroalkylpercarboxylate, as surfactant

(c) potassium chloride, and

(d) potasdsium monohydrogen phosphate,

wherein the last two mentioned components are present in the form of potassium chloride particles, the preponderance of which have a mesh size of about −100 to +325 coated over with the potassium monohydrogen phosphate.

4,954,317

BLOOD OXYGENATOR

Donald A. Raible, Santa Ana, Calif., assignor to Baxter International, Inc., Deerfield, Ill.

Continuation of Ser. No. 230,657, Aug. 9, 1988, abandoned, which is a continuation of Ser. No. 646,026, Aug. 29, 1987, abandoned, which is a continuation of Ser. No. 689,971, May 26, 1976, Pat. No. 4,268,476, which is a continuation-in-part of Ser. No. 584,464, Jun. 6, 1975, abandoned. This application Aug. 23, 1989, Ser. No. 399,424

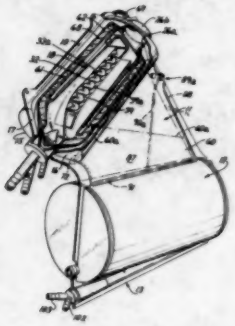
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[5] A61M *1/14*

U.S. Cl. 422—46 **3 Claims**

1. A bubble-type oxygenator having therein a bubble column having a first end and a second end, said bubble column being provided with a plurality of segments in end-to-end relationship, at least one of said segments having a serpentine passageway formed therein to promote secondary flow of blood bubbles passing therethrough, said passageway being provided with a plurality of turns so that said blood bubbles are continuously rotated throughout their passage through said passage-

way, and a heat exchange conduit disposed in effective heat exchange relationship with, but not in, the bubble column of



said oxygenator and in direct contact with the blood flow therefrom.

4,954,318

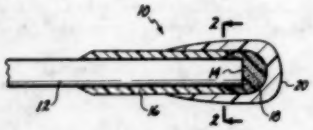
OPTICAL SENSOR

Masao Yafuso, El Toro; Cheng F. Yan, Irvine; Thomas G. Hacker, Anaheim; Henry K. Hui, Irvine; Thomas P. Maxwell, and William W. Miller, both of Santa Ana, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1987, Ser. No. 91,432

Int. Cl.[5] G01N *21/77*

U.S. Cl. 422—59 **25 Claims**



1. An apparatus for measuring the concentration of a component in a medium comprising:

optical sensor means including at least one optical indicator, which optical indicator provides an optical signal which varies according to the concentration of a component in a medium;

optical signal receiving means for receiving said optical signal from said optical sensor means; and

supply means containing additional optical indicator, said supply means being positioned adjacent to said optical sensor means and acting to provide said additional optical indicator to said optical sensor means.

4,954,319

MECHANISM FOR SUPPLYING ANALYTICAL TAPE FOR BIOCHEMICAL ANALYSIS BY PREDETERMINED LENGTH

Takashi Koizumi, and Hideo Ishizaka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 15, 1988, Ser. No. 284,638

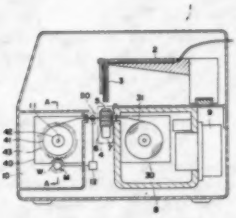
Claims priority, application Japan, Dec. 16, 1987, 62-318149; Dec. 16, 1987, 62-318150

Int. Cl.[5] G01N *35/00*

U.S. Cl. 422—67 **9 Claims**

1. A mechanism for supplying in sequence unused regions of an analytical tape by a predetermined length to an analytical section arranged in an apparatus for biochemical analysis of a liquid sample wherein application of the liquid sample onto an unused region of the analytical tape, incubation of an applied sample, and photometric measurement of an incubated sample are performed at the analytical section, one end and the unused regions following said end of the analytical tape being encased in a cassette and another end of the analytical tape being encased in another cassette for receiving the used regions of the analytical tape after the photometric measurement is complete, which comprises:

driving means for moving an analytical tape to supply unused regions of the analytical tape to an analytical section;



detecting means for detecting a length of the unused regions of the analytical tape supplied to the analytical section comprising a roller which is arranged in contact with a surface of the analytical tape so that said roller rotates with movement of the analytical tape for the supply of the unused regions to the analytical section and a means for detecting one of a number of rotations and an angle of a rotation of said roller; and

controlling means for controlling said driving means according to said one of said detected number of rotations and said angle of said rotation of said roller detected by said detecting means.

4,954,320

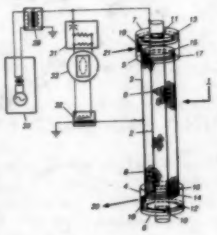
REACTIVE BED PLASMA AIR PURIFICATION

Joseph G. Birmingham, Joppa, and Robert R. Moore, Fallston, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 184,848, Apr. 22, 1988, abandoned. This application Aug. 31, 1989, Ser. No. 401,199

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186.04 **13 Claims**



1. A packed, alternating current electtrical discharge plasma device to decompose toxic contaminants in air for the purposes of air purification and general toxic and hazardous materials processing, including removal of ozone, carbon momoxide, and nitrogenous oxides from air, comprising;

(a) a first electrode facing a second electrode;

(b) a nonconducting packing material in a bed residing between said first and second electrodes;

(c) an alternating current power supply to include but not limited to a frequency range of 0.5 kilohertz to 40 kilohertz frequency;
(d) said power supply being connected to a transformer to produce high voltage alternating current to include but not limited to a voltage range of 4 kilovolts to 28 kilovolts;
(e) said transformer being connected between said first and second electrodes to produce an air plasma throughout a packed bed;
(f) said power supply, said transformer, said electrodes, and said packing comprisign a complex impedance wherein impedance matching is provided;
(g) said powder supply, said transformer, said electrodes, and said packing comprising a resonant electrical circuit wherein frequency tuning is provided; and
(h) said plasma with a power density necessary to achieve high decomposition efficiencies of toxic contaminants at both trace and percent concentrations, and flow capacities of 10 CFM or greater.

4,954,321

METHOD AND APPARATUS FOR OZONE GENERATION

Lonald H. Jensen, Twin Falls, Id., assignor to Scott Jensen Industries, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 317,215, Feb. 24, 1989, abandoned. This application Mar. 24, 1989, Ser. No. 328,485
Int. Cl.[5] B01J *19/08, 19/12*
U.S. Cl. 422—186.19 **89 Claims**

1. An apparatus for use with a source of high energy alternating electric power to generate ozone, said apparatus comprising:
(a) a first electrode; and
(b) an insulated second electrode comprising:
(i) a sealed dielectric envelope having first and second portions, said first portion being positioned remote from said first electrode, and said second portion being positioned proximate to said first electrode, thereby to define between said second portion and said first electrode a reaction space wherein ozone is generated from an oxygen-bearing feed gas; and
(ii) discharge means for generating electrical phenomena in said dielectric envelope, thereby to generate ozone from the feed gas in said reaction space, said discharge means comprising:
(A) an inert gas under low pressure filling said dielectric envelope; and
(B) an electric terminal located in said first portion of said dielectric envelope and being couplable through said dielectric envelope to said first electrode when the source of high energy alternating electric power is applied between said first electrode and said electric terminal.

4,954,322

PROCESS FOR THE RECOVERY OF METAL VALUES CONTAINED IN A GANGUE

Jean-Michel DeMarthe, Mont Saint Eloi, France, assignor to Metaleurop S.A., Fontenay Sous Bois, France

Filed Jul. 27, 1989, Ser. No. 385,456
Claims priority, application France, Jul. 29, 1988, 88 10304
Int. Cl.[5] C01G *15/00, 17/00, 49/14*
U.S. Cl. 423—95 **10 Claims**

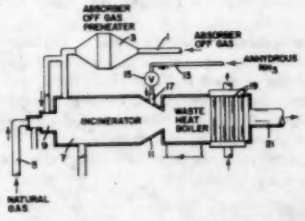
7. Process for the recovery of metal values contained in a ferric gangue, characterized in that it comprises the following stages:
(a) dissolution of the metal values from the ferric gangue with sulphuric acid,
(b) recovery of the metal values,
(c) evaporation of the acid ferric solution resulting from stage (b) so as to increase the acidity to a value of between about 50 and 100% so as to take the ferric iron concentration to a value of between approximately 1M and 2M, the said evaporation being followed by a stage of addition of concentrated sulphuric acid or oleum to adjust the sulphuric acid concentration to a value greater than about 10N,
(d) crystallization from this solution, at a temperature of between −10° and 50° C., of a hydrated iron sulphate of formula $Fe_2(SO_4)_3.9H_2O$.

4,954,323

AOG INCINERATOR NO_x EMISSION CONTROL VIA NH_3 INJECTION

Edward J. Sockell, Port Lavaca, Tex., assignor to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 1, 1988, Ser. No. 265,739
Int. Cl.[5] C01B *21/00*
U.S. Cl. 423—235 **6 Claims**



1. The process for the non-catalytic reduction of the concentration of NO_x from combusion effluents by means of injecting ammonia into said effluents wherein the process comprises injecting said ammonia tangentially into said effluents through an opening in a venturi, wherein said effluents are experiencing an increased flow velocity within said venturi, and wherein said venturi directly connects a means for incineration to produce said combusion effluents to a means for cooling said combustion effluents.

4,954,324

METHOD OF BAGHOUSE BROWN PLUME POLLUTION CONTROL

Richard G. Hooper, Littleton, Colo., assignor to NaTec Resources, Inc., Houston, Tex.

Division of Ser. No. 174,654, Mar. 29, 1988, Pat. No. 4,908,194. This application Mar. 10, 1989, Ser. No. 321,308

Int. Cl.[5] B01J *8/00*; C01B *21/00, 17/00*

U.S. Cl. 423—239 16 Claims

1. An SO_x/NO_x air pollution control process employing a baghouse to simultaneously control particulate emissions comprising the steps of:

(a) introducing a sodium-based sorbent into a stream of flue gas from an industrial or utility plant burning fossil fuels or waste to generate electricity, steam or heat, said flue gas containing SO_x and NO_x and having a temperature above about 200° F. and below about 700° F.;

(b) introducing as additives, urea and ammonia into said flue gases in an amount ranging from about 1 to about 25% by weight of said sodium-based sorbent;

(c) maintaining said sorbent and said additives in contact with said flue gas for a time sufficient to react said sorbent with some of said SO_x and NO_x thereby reducing the concentration of said SO_x and NO_x in said flue gas;

(d) said additives, as compared to use of said sorbent without said additives, increasing the percent SO_x removal and the percent NO_x removal by said sorbent while suppressing conversion of NO to NO_2 by said sorbent to below about the visible brown plume threshold; and

(e) collecting said reacted sorbent and additive in a baghouse.

4,954,325

COMPOSITION OF SYNTHETIC POROUS CRYSTALLINE MATERIAL, ITS SYNTHESIS AND USE

Mae K. Rubin, Bala Cynwyd, Pa., and Pochen Chu, West Deptford, N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 254,524

Int. Cl.[5] C01B *33/26*

U.S. Cl. 423—328 30 Claims

1. A synthetic porous crystalline material characterized by an X-ray diffraction pattern in its calcined form including values substantially as set forth in Table III of the specification and having equilibrium adsorption capacities of greater than about 10 wt. % for water vapor, greater than about 4.5 wt. % for cyclohexane vapor and greater than about 10 wt. % for n-hexane vapor.

16. A method for preparing a synthetic crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table III of the specification and having equilibrium adsorption capacities of greater than about 10 wt. % for water vapor, greater than about 4.5 wt. % for cyclohexane vapor and greater than about 10 wt. % for n-hexane vapor, said crystalline material having a composition comprising the molar relationship

$$X_2O_3:(n)YO_2$$

wherein n is at least about 10, X is a trivalent element and Y is a tetravalent element, said method comprising preparing a reaction mixture capable of forming said material upon crystallization, said reaction mixture containing sufficient amounts of alkali or alkaline earth metal cations, a source of tetravalent Y oxide containing at least about 30 wt. % solid YO_2, a source of trivalent X oxide, water and hexamethyleneimine, and maintaining said reaction mixture under sufficient crystallization conditions until crystals of said material are formed.

4,954,326

PREPARATION OF CRYSTALLINE ALUMINOSILICATE ZEOLITE, AND ITS PRODUCT

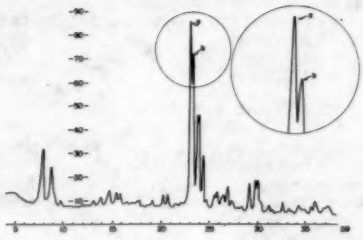
Tamio Onodera; Tokuji Sakai; Yasuo Yamasaki, and Koji Sumitani, all of Matsuyama, Japan, assignors to Teijin Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 891,063, Jul. 31, 1986, abandoned, which is a continuation of Ser. No. 757,928, Jul. 23, 1985, abandoned, which is a continuation of Ser. No. 495,825, May 18, 1983, abandoned. This application Jul. 12, 1989, Ser. No. 380,723

Claims priority, application Japan, May 19, 1982, 57-83240

Int. Cl.[5] C01B *33/28*

U.S. Cl. 423—328 14 Claims



1. A process for producing a crystalline aluminosilicate zeolite characterized by having (a) a silica/alumina mole ratio of from 10 to 100, (b) X-ray lattice distances d shown in Table A of the specification, (c) a specific n-hexane adsorption, as measured on a precisely weighed sample of the zeolite which has been calcined at 450° for 8 hours until the pressure reaches 50±1 mm Hg, and maintained at 20±1° C. for 2 hours of at least 0.07 g/g, (d) a (2-methylpentane/cyclohexane) adsorption ratio of from 1.2 to 1.6, and (e) when the intensity (I_o) of the X-ray diffraction peak at d(Å)=3.86 is taken as 100, the relative intensity (I/I_o) of the X-ray diffraction peak at d(Å)=3.83 is at least 70, which comprises maintaining a silica source, an alumina source, and a seed zeolite selected from the group consisting of zeolite ZSM-5 and zeolites having said characteristics (a)-(e) inclusive, specified above, in an aqueous solution containing 1 to 200 millimoles, per gram of said zeolite, of an alkali metal hydroxide, in such proportions that the silica source, the alumina source and the alkali metal hydroxide satisfy the following mole ratios in terms of SiO_2, Al_2O_3 and OH^-:

$$SiO_2/Al_2O_3 = 5\text{–}100$$

$$OH^-/(SiO_2 + Al_2O_3 = \text{about } 0.5\text{–}1 \text{ and}$$

$$OH^-/H_2O = 0.005\text{–}0.05,$$

and under such temperature, pressure and time conditions as to produce a crystalline aluminosilicate zeolite.

4,954,327

PRODUCTION OF SILICA AEROGELS

David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Filed Aug. 12, 1988, Ser. No. 231,353

Int. Cl.[5] C01B *33/12*; B01J *13/00*; C03C *3/00*

U.S. Cl. 423—338 6 Claims

1. The process for the production of silica aerogels which consists of foaming, mixing and reacting the following components in water:

(a) oxidated silicon compound selected from the group consisting of alkali metal silicates, alkaline earth metal silicates, silicate minerals, silicic acid sol, aqueous suspension

of colloidal silica and mixtures thereof, in the amount of 50 to 100 parts by weight;

(b) salt forming compound selected from the group consisting of mineral acid, organic acids and mixtures thereof, in the amount of 1 to 10 parts by weight; and

(c) gas selected from the group consisting of air, nitrogen, hydrogen, oxygen, organic gases and mixtures thereof, in the amount of 1 to 10 parts by weight to produce a foamed silica gel, the foamed silica gel is then dried.

4,954,328

SYNTHESIS OF HYDROXYLAMINE SALTS

Kerry L. Wagaman, Clinton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1983, Ser. No. 470,812

Int. Cl.[5] C01B *21/14*

U.S. Cl. 423—386 **14 Claims**

1. A method for preparing a hydroxylamine acid salt which comprises:

preparing a slurry of hydroxylamine sulfate in an alcohol at a temperature not in excess of about 60° C.;

high-shear mixing sodium alkoxide with said slurry to form a hydroxylamine-alcohol solution and sodium sulfate while maintaining the temperature of said slurry at or below 60° C.;

removing sodium sulfate;

agitating said solution;

admixing an acid selected from the group consisting of perchloric acid and nitric acid with said solution at a temperature not in excess of about 55° C. to form said hydroxylamine acid salt; and

recovering said hydroxylamine acid salt.

4,954,329

PROCESS AND APPARATUS FOR PREPARATION OF FINELY GRAINED LEAD AZIDE

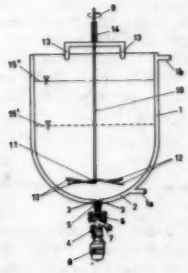
Botho Klossner, Hilterfingen, and Paul Lörtscher, Brenzikofen, both of Switzerland, assignors to Schweizerische Eidgenossenschaft, Thun, Switzerland

Filed Jul. 17, 1989, Ser. No. 380,303

Claims priority, application Switzerland, Jul. 28, 1988, 02882/88

Int. Cl.[5] C01B *21/08*

U.S. Cl. 423—410 **5 Claims**



1. A process for the preparation of finely grained lead azide, in which aqueous solutions of lead nitrate and sodium azide are stirred in a vessel at constant temperature, characterized in that in a first process step the aqueous solution of lead nitrate and an aqueous solution of sodium citrate are poured into the vessel wherein the weight of sodium citrate is about 0.32% the weight of the lead nitrate; in a second process step, the aqueous solution of sodium azide is dosed into the vessel over a period of time of 30 to 40 minutes; the aqueous solutions poured into the vessel are stirred at a peripheral stirring speed of between 0.2 m/sec and 1.0 m/sec, and the constant temperature is maintained with a range of 50° C. to 80° C.

4,954,330

PROCESS FOR PURIFYING HYDROGEN FLUORIDE

William C. Ziegenhain, Ponca City, Okla., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Nov. 30, 1989, Ser. No. 443,373

Int. Cl.[5] C01B *7/19*; C01G *28/00*; B01D *3/34*

U.S. Cl. 423—484 **8 Claims**

1. A process for purifying anhydrous hydrogen fluoride comprising the steps of:

(a) contacting anhydrous hydrogen fluoride containing trivalent arsenic impurities with an effective amount of hexavalent chromium oxide and oxygen to oxidize substantially all of said trivalent arsenic to pentavalent arsenic; and

(b) distilling the resulting mixture, thus recovering anhydrous hydrogen fluoride with reduced levels of impurities.

4,954,331

SULFUR RECOVERY PROCESS USING METAL OXIDE ABSORBENT

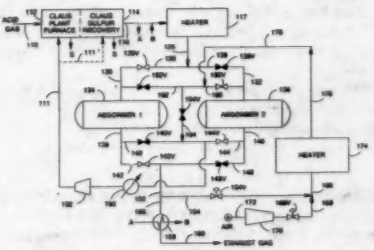
Min-Hsiun Lee, and Paul T. Pendergraft, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 195,426, May 11, 1988, abandoned, which is a continuation of Ser. No. 893,111, Aug. 4, 1986, abandoned. This application Jan. 10, 1989, Ser. No. 296,294

The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.

Int. Cl.[5] B01D *53/34*; C01B *17/04*

U.S. Cl. 423—574 R **11 Claims**



1. In a process for the recovery of sulfur comprising (a) introducing a H_2S containing stream into a Claus plant producing Claus plant effluent; (b) during an absorption period introducing Claus plant effluent into a first absorption zone containing ZnO absorbent and reacting at least H_2S with ZnO producing sulfided absorbent ZnS and absorber effluent; and (c) concurrently introducing O_2 and a fraction of first absorption zone effluent into a second absorption zone regenerating ZnS to ZnO and returning effluent to the Claus plant, the improvement comprising:

(1) lengthening the absorption period in the first absorption zone by introducing a feed consisting of Claus plant effluent having H_2S:SO_2 in a 2:1 molar ratio into at least one Claus catalytic reaction zone operated under conditions including temperature effective for depositing a preponderance of sulfur formed on Claus catalyst to thereby produce effluent provided to the first absorption zone having a reduced content of sulfur compounds relative to Claus plant effluent;

(2) decreasing rate of return of effluent to the Claus plant due to (i) a reduced content of sulfur compounds in feed provided to the first absorption zone resulting from step

(1) combined with (ii) a reduced fraction of absorber effluent being provided to the second absorption zone regenerating ZnS to ZnO, said reduced fraction being less than 20% of the absorber effluent, and lengthening the regeneration period in the second absorption zone correspondingly to the lengthened absorption period in the first absorption zone and concurrently introducing O_2 in minimum amounts necessary for complete regeneration of ZnS to ZnO in the lengthened regeneration period.

4,954,332

PHOTOPROTECTION COMPOSITIONS COMPRISING TOCOPHEROL SORBATE AND AN ANTI-INFLAMMATORY AGENT

Donald L. Bissett, Hamilton; Rodney D. Bush, Cincinnati, and Ranjit Chatterjee, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 112,575, Oct. 22, 1987, Pat. No. 4,847,071. This application Jun. 26, 1989, Ser. No. 346,435

Int. Cl.[5] A61K *7/027, 7/106, 7/42, 9/12*

U.S. Cl. 424—59 **20 Claims**

1. A photoprotective composition useful for topical application comprising:

(a) a safe and photoprotectively effective amount of a radical scavenging compound selected from the group consisting of tocopherol and tocopherol esters selected from acetate, succinate, propionate, oleate, orotate, benzoate, p-aminobenzoate, p-nitrobenzoate, linoleate, nicotinate, 2-ethylhexanoate and sorbate, and mixtures thereof;

(b) a safe and photoprotectively effective amount of an anti-inflammatory agent selected from the group consisting of a steroidal anti-inflammatory agent; a non-steroidal anti-inflammatory agent selected from the group consisting of the oxicams, the salicylates, the acetic acid derivatives, the fenamates, the propionic acid derivatives, the pyrazoles, the 2,6-di-tert-butyl phenol derivatives, and the 2-naphtyl-containing ester compounds; and a natural anti-inflammatory agent selected from the group consisting of candelilla wax, alpha bisabolol, *Aloe vera*, Manjistha, and Guggal;

(c) a safe and photoprotectively effective amount of a sunscreening agent; and

(d) a safe and effective amount of a topical carrier.

4,954,333

TRANSPARENT ANTIPERSPIRANT COMPOSITIONS AND METHOD OF PREPARATION

Andrew H. Ward, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 31, 1989, Ser. No. 304,075

Int. Cl.[5] A61K *7/32, 7/34, 7/36, 7/38*

U.S. Cl. 424—66 **9 Claims**

1. A transparent antiperspirant composition comprising:

(a) from 5 to 30 wt. % of the reaction product of:

5 to 15 parts by weight of an antiperspirant salt selected from the group consisting of the hydrated chlorine salts of aluminum, zirconium and zinc, the hydrated bromine salts of aluminum, zirconium and zinc and mixtures thereof; and

1 part by weight of a silane of the formula:

$$R^1Si(OR^2)_3 \quad \text{(i)}$$

wherein R^1 represents a member of the group consisting of alkyl groups of from C_2 to C_5, and aryl groups of from C_6 to C_{12}, and R^2 represents an alkyl group of from C_1 to C_5;

(b) from 60 to 95 wt. % of a polyol having the formula:

$$R^3(OH)_2 \quad \text{(ii)}$$

wherein R^3 represents an alkyl group of from C_2 to C_6.

4,954,334

FOOT POWDER COMPOSITION

Monroe S. Pugh, and Robert L. Pugh, both of Rte. 1, Box 48, Mouth of Wilson, Va. 24363

Continuation-in-part of Ser. No. 2,560, Jan. 12, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,483

Int. Cl.[5] A61K *7/38*

U.S. Cl. 424—68 **4 Claims**

1. A composition for suppressing perspiration of the feet consisting essentially of boric acid powder and aluminum ammonium sulfate powder, said powders each being present to the extent of 40% to 60% by weight of the composition, said aluminum ammonium sulfate being characterized in that its two percent aqueous solutions will have a pH between 3.4 and 3.5, a two percent aqueous solution of the composition having a pH between 3.5 and 3.6.

4,954,335

CLEAR CONDITIONING COMPOSITION AND METHOD TO IMPART IMPROVED PROPERTIES TO THE HAIR

Ben Janchipraponvej, Niles, Ill., assignor to Helene Curtis, Inc., Chicago, Ill.

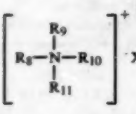
Filed May 31, 1989, Ser. No. 359,483

Int. Cl.[5] A61K *7/075*

U.S. Cl. 424—070 **35 Claims**

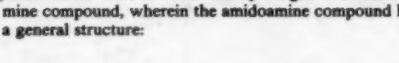
1. A hair-conditioning composition comprising:

(a) from about 0.5% to about 5% by weight of a quaternary ammonium compound, wherein the quaternary ammonium compound has a general structure:



wherein R_8 is an alkyl group including from about 8 to about 22 carbon atoms; R_9 is selected from the group consisting of an alkyl group including from about 8 to about 22 carbon atoms, a hydrogen atom, a methyl group, an ethyl group, a hydroxymethyl group and a hydroxyethyl group; R_{10} is selected from the group consisting of a benzyl group, a hydrogen atom, a methyl group, an ethyl group, a hydroxymethyl group and a hydroxyethyl group; R_{11} is selected from the group consisting of a hydrogen atom, a methyl group, an ethyl group, a hydroxymethyl group and a hydroxyethyl group; and X is selected from the group consisting of chloride, bromide, methosulfate, ethosulfate, tosylate, acetate, phosphate and nitrate;

(b) from about 0.1% to about 5% by weight of an amidoamine compound, wherein the amidoamine compound has a general structure:



wherein R_1 is a fatty acid chain containing from about 11 to about 21 carbon atoms; R_2 is an alkylene group containing from two to about four carbon atoms; R_3 is hydrogen, a methyl group an ethyl group or a hydroxyalkylene group containing from one to about three carbon atoms; R_4 is a m ethyl group, an ethyl group or a hydroxyalkylene group containing from one to about three carbon atoms; and Y is an organic heterocyclic nitrogen-containing moiety;

(c) from about 0.5% to about 5% by weight of a volatile conditioning agent selected from the group consisting of a linear polydimethylsiloxane having a viscosity at 25° C. in the range from about 0.5 centistokes to about 5 centistokes and a boiling point at atmospheric pressure ranging from

about 100° C. to about 250° C., a cyclic polydimethylsiloxane having a viscosity at 25° C. of from about 2 centistokes to about 6 centistokes and a boiling point at atmospheric pressure ranging from about 150° C. to about 250° C., an aliphatic hydrocarbon having from about 10 carbon atoms to 26 carbon atoms and a boiling point at atmospheric pressure in the range of from about 100° C. to about 300° C., and mixtures thereof;

(d) from about 1% to about 10% by weight of a nonionic surfactant capable of solubilizing the volatile conditioning agent;

(e) from about 10% to about 30% by weight of a polyhydric alcohol selected from the group consisting of glycols, triols, polyols and mixtures thereof; and

(f) a suitable liquid vehicle; wherein the weight ratio of the nonionic surfactant to the volatile conditioning agent is at least 1 to 1 and the pH of the composition is in the range of from about 4 to about 7.

4,954,336

NON-AEROSOL PUMP HAIR SPRAY COMPOSITIONS

Jui-Chang Chuang, Wayne; Edward Walls, Jr., Cranford; Stephen C. Johnson, Newton, and Mohammed Tazi, Wayne, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed May 22, 1989, Ser. No. 354,870
Int. Cl.[5] A61K *7/11*
U.S. Cl. 424—71 **9 Claims**

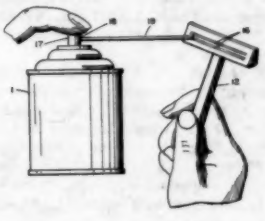
1. A non-aerosol pump hair spray composition capable of being applied by the user as a fine spray mist which dries rapidly and provides effective hair holding power without nozzle clogging consisting essentially of from about 6 to 20% by weight of a hair fixative resin derived from an ethanol solution of a C_2–C_4 alkyl which half-ester of a 1:1 alternating copolymer of maleic anhydride and a C_1–C_5 alkyl vinyl ether, the solution having a relative viscosity of about 1.20 to about 1.35, the carboxyl groups of which are 10 to 100% neutralized with a water soluble base and about 65 to 94% ethanol or aqueous ethanol solvent.

4,954,337

NOVEL SHAVING COMPOSITION

Anna A. Gripp, Nutley, and Gottfried Metzler, III, Brookside, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 26, 1988, Ser. No. 198,909
Int. Cl.[5] A61K *7/15*
U.S. Cl. 424—73 **15 Claims**



1. A composition for treating the blade of a razor such that shaving can be performed in the absence of first applying any shaving preparation directly to the area to be shaved comprising an effective amount of a mixture a non-foaming lubricant and a solubilizer wherein said lubricant contains at least a silicone glycol copolymer.

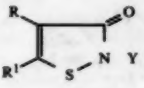
4,954,338

MICROBICIDAL MICROEMULSION

John R. Mattox, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 81,922, Aug. 5, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 209,620
Int. Cl.[5] A61K *31/74*; A01N *25/00, 31/14*; C11D *3/48*
U.S. Cl. 424—78 **29 Claims**

1. A microemulsion comprising from 0.1–50% by weight of an isothiazolone having a water solubility of less than 1% by weight of the formula:



wherein Y is

an unsubstituted alkyl group of 2 to 18 carbon atoms,

a substituted alkyl group of 2 to 18 carbon atoms having at least one hydrogen atom replaced by hydroxy, halo, cyano, alkylamino, dialkylamino, phenylamino, halophenylamino, carboxy, carbalkoxy, alkoxy, aryloxy, morpholino, piperidino, pyrrolidonyl, carbamoxy, or isothiazolonyl, wherein the total number of carbon atoms in the substituted alkyl group does not exceed 18,

an unsubstituted or halo-substituted alkenyl group of 4 to 18 carbon atoms,

unsubstituted or halo-substituted alkynyl group of 4 to 18 carbon atoms,

an unsubstituted or alkyl-substituted cycloalkyl group having a four to six carbon atom ring and up to 12 carbon atoms,

an unsubstituted or a halo-, lower alkyl-, or lower alkoxy-substituted aralkyl group wherein the total number of carbon atoms in the aralkyl group does not exceed 10; or

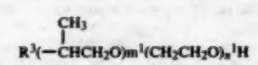
an unsubstituted or a halo-, nitro-, lower alkyl-, or lower carbalkoxy-, substituted aryl group wherein the total number of carbon atoms in the aryl group does not exceed 10; and

R and R^1 are the same or different substituent selected from hydrogen, halogen, or a (C_1–C_4) alkyl group; and

from 0.1 to 25% by weight of an anionic surfactant;

from 0.1 to 25% by weight of a cosurfactant selected from alkyl alcohols and alkylalkoxylated alcohols;

from 0.5 to 50% by weight of a polyoxyethylene/polyoxypropylene block copolymer of the formula:



wherein R^3 is lower alkoxy or a radical of the formula $HO(CH_2CH_2O)_{n^1}$ where m^1 is an integer greater than 15 and n^1 is an integer greater than 10;

from 10 to 99% by weight of water; and from 0 to 30% by weight of an adjuvant or adjuvants.

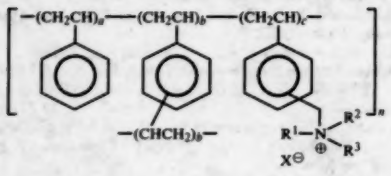
4,954,339

NOVEL POLYSTYRENE ANION EXCHANGE POLYMERS

Albert A. Jaxa-Chamiec, Rickmansworth, and Deirdre M. B. Hickey, Saffron Walden, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Dec. 21, 1988, Ser. No. 288,049
Claims priority, application United Kingdom, Dec. 23, 1987, 8730010
Int. Cl.[5] A61K *31/74*; C08C *19/12*; C08F *12/36, 112/36*
U.S. Cl. 424—78 **16 Claims**

1. A crosslinked polystyrene polymer of structure (I)



(I)

in which,

R^1 is a saturated or unsaturated C_8 to C_{30} alkyl group;

R^2 and R^3 are the same or different and are each C_{1-4}alkyl;

X− is a physiologically acceptable counter ion;

a, b and c are numbers which indicate the relative molar percentages of the units present in a random distribution in said polymer, (b) being from about 0.5 to about 10 molar percent, and (c) being from about 30 to about 99 molar percent; and

n is a number indicating the number of repeating units in said polymer.

4,954,340

METHOD FOR ACTIVATING HEMOCYTES OF BIVALVES FOR PEARL PRODUCTION

Haruhisa Maeda, Kumamoto; Akira Tsujikawa, Hondo, and Sadao Susumi, Kumamoto, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Filed Aug. 2, 1988, Ser. No. 227,400

Claims priority, application Japan, Apr. 23, 1988, 63-100979

Int. Cl.[5] C01F *11/18*; A61K *35/56, 39/02*

U.S. Cl. 424—92 **16 Claims**

1. A method for producing a pearl by a nucleus insertion operation including the step of inserting a nucleus and a section of a mantle part of a donor bivalve into a bivalve capable of producing a pearl, characterized by the step of applying a mitogen selected from the group consisting of lipopolysaccharides, lectins, purified protein derivatives derived from acid-fast bacteria and inactivated microorganisms containing lipopolysaccharides to the section of the mantle part of the donor bivalve to be inserted.

4,954,341

HAIR COSMETIC COMPOSITION

Sigemi Nakamura, Chiba; Hideo Kurokawa, Machida, and Jouji Mitamura, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 938,491, Dec. 5, 1986, abandoned. This application Jun. 21, 1988, Ser. No. 220,957

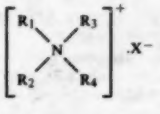
Claims priority, application Japan, Dec. 10, 1985, 60-278813

Int. Cl.[5] A61K *7/00*

U.S. Cl. 424—70 **5 Claims**

1. A hair cosmetic composition comprising:

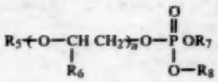
(A) at least one quaternary ammonium salt in an amount of 0.05 to 10% by weight, having the formula:



(I)

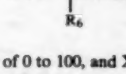
wherein R_1 is an alkenyl having 14 to 24 carbon atoms, R2 in an alkyl or alkenyl having 14 to 24 carbon atoms, R3 and R4 are independently methyl, ethyl, a polyoxyethylene having an average polymerization degree of 1 to 5, or polyoxypropylene having an average polymerization degree of 1 to 5, and X⁻ is an anion, and having an iodine value of 35 to 100; and

(B) a phosphate in an amount of 0.05 to 10% by weight, having the formula:



(II)

wherein R_5 is a linear alkyl having 1 to 22 carbon atoms, a hydroxyalkyl having 1 to 22 carbon atoms, an alkenyl having 2 to 22 carbon atoms, an alkylphenyl having 7 to 22 carbon atoms, or glyceryl, R_6 is hydrogen or methyl, R7 is hydrogen, an alkali metal, a C_1–C_{20} alkyl-substituted ammonium, or a C_1–C_{20} hydroxyalkyl-substituted ammonium, R_8 is a group having the formula:



or R_7, n is an integer of 0 to 100, and X is the same as defined above.

4,954,342

PHARMACEUTICAL COMPOSITION FOR INTERARECTAL ADMINISTRATION OF A CALCITONIN AND UNIT DOSAGE FORMS PREPARED THEREFROM

Filippo Lattanzi, and Riccardo Vanni, both of Siena, Italy, assignors to Sclavo S.p.A., Siena, Italy

Filed Sep. 26, 1988, Ser. No. 249,776

Claims priority, application Italy, Sep. 25, 1987, 22031 A/87

Int. Cl.[5] A61K *9/02, 9/48*

U.S. Cl. 424—436 **28 Claims**

1. A pharmaceutical composition containing a calcitonin as the active ingredient and suitable for the preparation of capsules for intrarectal administration or microenemas, said composition comprising a calcitonin dissolved in a liquid vehicle comprising:

(a) at least 70% by weight of a polyethylene or polypropylene glycol or a mixture of polyethylene or polypropylene glycols of different molecular weights, having the consistency of a homogeneous fluid at room temperature, and

(b) less than 15% by weight of a physiologically acceptable aqueous buffer having a pH range of from 4.5 to 6.5.

4,954,343

DERMAL PHARMACEUTICAL PREPARATIONS

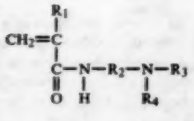
Yoshifumi Hosaka; Saburo Otsuka; Takashi Kinoshita, and Yusuke Ito, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 175,985, Mar. 31, 1988, abandoned. This application Sep. 12, 1989, Ser. No. 406,200

Int. Cl.[5] A61F *13/02*

U.S. Cl. 424—448 **7 Claims**

1. A dermal pharmaceutical preparation comprising a soft support having provided thereon a pressure-sensitive adhesive layer containing a pressure-sensitive adhesive and a drug in the amount of 0.1 to 30% by weight based on the total weight of said adhesive and drug wherein said pressure-sensitive adhesive is a copolymer comprising a (meth)acrylamide having an amino group as a comonomer unit, wherein the (meth)acrylamide having an amino group is represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents an alkylene group; and R_3 and R_4 each represents a hydrogen atom, an alkyl group, or a phenyl group.

4,954,344

METHOD FOR TREATING NOCTURNAL ANGINA

Robert M. Gale, Mountain View, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 132,829, Dec. 14, 1987, Pat. No. 4,812,313. This application Nov. 10, 1988, Ser. No. 269,835

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.[5] A61K *9/00*; A01N *25/12*

U.S. Cl. 424—448 **4 Claims**

1. A method for diminishing the occurrence of nocturnal angina attacks in a patient, which method comprises:

(a) positioning on the skin at a location selected from the group consisting of arm, abdomen, chest, back, thigh, leg and buttocks of a patient prone to nocturnal anginal attacks, a medical bandage comprising:

(1) a backing member that is substantially impermeable to the passage of drug;

(2) a reservoir in contact with the backing member, the reservoir comprising an oil selected from the group consisting of natural and synthetic oils, rheological means for increasing the viscosity of the oil, and a drug useful for diminishing the occurrence of nocturnal anginal attacks;

(3) a rate controlling membrane in contact with the backing member and the reservoir comprising a polymeric composition that aids in controlling the release of the drug from the medical bandage; and,

(b) administering transdermally the drug to the patient in a therapeutically effective amount of producing the intended therapy.

4,954,345

DERMALLY ACTING PHARMACEUTICAL PREPARATION WITH LIPOSOMES AS VEHICLE MEANS

Joseph Müller, Lindenfels, Fed. Rep. of Germany, assignor to Rohm Pharma GmbH, Weiterstadt, Fed. Rep. of Germany

Continuation of Ser. No. 924,014, Oct. 28, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,545

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542773

Int. Cl.[5] A61K *9/127, 37/22*

U.S. Cl. 424—450 **13 Claims**

1. A dermally acting pharmaceutical preparation for external application to the skin, consisting essentially of:

a dispersion, wherein said dispersion comprises urea and at least one active ingredient selected from the group consisting of corticosteroids and trihydroxyanthracenes and is in dissolved, emulsified or suspended form,

and wherein said urea and said active ingredient are incorporated or enclosed in liposomes.

4,954,346

ORALLY ADMINISTRABLE NIFEDIPINE SOLUTION IN A SOLID LIGHT RESISTANT DOSAGE FORM

Gregory Sparta, Boulder, Colo., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 8, 1988, Ser. No. 204,060

Int. Cl.[5] A61K *9/40*

U.S. Cl. 424—456 **24 Claims**

1. A gelatin encapsulated liquid fill formulation of nifedipine which is substantially stable against light degradation condition comprising a capsule wall formulation encasing a capsule fill formulation, said capsule wall formulation comprising gelatin in an amount sufficient to encapsulate said capsule fill composition, with or without a pharmaceutically acceptable, ingestible, plasticizer for gelatin; said fill formulation comprising 5–60 mg of nifedipine, and a mixture of a carbonate and a surfactant in an amount sufficient to dissolve said nifedipine, and in a ratio of carbonate to surfactant of from 99:1 to 1:99, said carbonate being selected from a di-C_{1-10} alkyl carbonate and a compound of the formula

I

wherein A is a C_{1-4}-alpha,omega-alkylene which is unsubstituted or substituted by C_{1-4} alkyl; said surfactant being selected from compounds of formula II, IIa, and IIb, decaglycerol mono-dioleate, glycerol polyethylene glycol ricinoleate, and glycerol polyethylene glycol oxystearate; said formula II being a substituted cyclic ether having d ring members and being

II

wherein B is a C_{1-4}-alpha,omega-alkylene; n is an integer 0 to d−1; m is an integer of from 0 to (d−n−1); each R is each R is independently H or a C_{1-4} alkyl which is unsubstituted or substituted by at least one R^1; each R^1 is independently a hydroxy which is free, etherified by R^2, or esterified by R^3, each R^2 is a C_{2-4} straight or branched oxyalkylene or poly(C_{2-4} straight or branched oxyalkylene), the terminal oxygen of which is bound to H or R^3; and each R^3 is independently an acyl of a C_{2-24} alkanoic acid or a C_{4-24} alkenoic acid; provided that in each compound of formula II there is at least one free hydroxy group, and at least one R^3 group; said formula IIa being

$$R_c—O(CH_2CH_2O)_pR_d \qquad \text{(IIa)}$$

wherein p is, on average, 6–8, R_c is stearoyl or palmitoyl or mixtures thereof, and R_d is hydrogen or the same as R_c; said formula IIb being

$$R_e(OCH_2CH_2)_fOR_g \qquad \text{(IIb)}$$

wherein R_e is C_{10-18} alkyl, f is an integer of from about 10 to about 60, and R_g is hydrogen or the same as R_e; said gelatin encapsulated liquid fill formulation further comprising a dye in at least one of said shell formulation and said capsule fill formulation.

4,954,347

LONG LASTING COMPOSITION OF PROPAFENONE AND QUINIDINE FOR TREATMENT OF CARDIAC CONDITIONS

Edward B. Kristen, Nutley, N.J., and Juan R. Guerrero, Durham, N.C., assignors to BASF K & F Corp., Whippany, N.J.

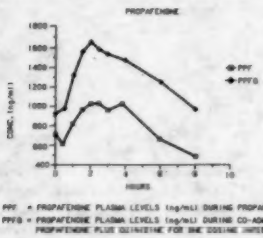
Filed May 3, 1988, Ser. No. 189,544

Int. Cl.[5] A61K *9/20*

U.S. Cl. 424—456 **13 Claims**

1. A pharmaceutical composition suitable for the treatment of a patient having cardiac arrhythmia comprising: an antiar-

rhythmic therapeutically effective amount of propafenone of 50–600 mg and a subtherapeutic amount of quinidine effective



PPF = PROPAFENONE PLASMA LEVELS (ng/ml) DURING PROPAFENONE ADMINISTRATION
PPFQ = PROPAFENONE PLASMA LEVELS (ng/ml) DURING CO-ADMINISTRATION OF PROPAFENONE PLUS QUINIDINE FOR THE DOSAGE INTERVAL (IE HOURS)

for prolonging the elimination half-life of the propafenone, in combination with a pharmaceutical carrier therefor.

4,954,348

NON-IONIC POLYOL CONTRAST MEDIA FROM IONIC CONTRAST MEDIA

Milos Sovak, Rancho Santa Fe, Calif., and Ramachandran Ranganathan, Princeton, N.J., assignors to Cook Imaging Corporation, Bloomington, Ind.

Division of Ser. No. 110,110, Oct. 13, 1987, abandoned, which is a continuation of Ser. No. 894,934, Aug. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 764,274, Aug. 9, 1985, abandoned. This application Jul. 1, 1988, Ser. No. 214,663

Int. Cl.[5] **C07C** *237/46;* **A61K** *31/165, 49/04*

U.S. Cl. 424—5 **2 Claims**

1. A contrast medium formulation comprising 5-(N-2,3-dihydroxypropylacetamido)-2,4,6-triiodo-N-(23, -dihydroxypropyl)-N'-(2-hydroxyethyl)-isophthalamide in a physiologically acceptable medium at a concentration in the range of about 50 to 400 mg I/ml.

2. 5-(N-b 2,3-dihydroxypropylacetamido)-2,4,6-triiodo-N-(2-3,-dihydroxypropyl)-N'-(2-hydroxyethyl)-isophthalamide.

4,954,349

ORAL MAGNESIUM AND POTASSIUM COMPOSITIONS AND USE

Pravin B. Sheth, Netcong, and Frederick J. Dechow, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 95,750, Sep. 11, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 325,106

Int. Cl.[5] **A61K** *9/36*

U.S. Cl. 424—461 **9 Claims**

1. A solid oral composition in the form of a tablet, capsule or sachet for the treatment or prophylaxis of potassium and magnesium deficiency in skeletal and cardiac muscle in a patient, said composition containing, as the active ingredients thereof,

(a) about 3 to about 50 milliequivalents of bioavailable potassium in the form of a salt;

(b) about 0.1 to about 25 milliequivalents of bioavailable magnesium in the form of a salt;

(c) wherein the milliequivalent ratio of potassium to magnesium is between about 2:1 and about 14:1; and

(d) wherein the potassium is in a controlled release form comprising said potassium and an overcoat layer comprising at least one polymer selected from cellulose, cellulose derivative, and acrylic containing or methacrylic containing polymers, adapted so that upon oral administration, the bioavailable potassium is released into the gastrointestinal tract at a rate sufficiently low so as to minimize potassium induced local gastrointestinal irritation.

4,954,350

PHARMACEUTICAL FORMULATIONS CONTAINING ACRIVASTINE

Harry P. Jones; Robert J. Mackey, and Michael J. D. Gamlen, all of Dartford, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 173,262, Mar. 25, 1988, abandoned. This application May 15, 1989, Ser. No. 355,142

Claims priority, application United Kingdom, Mar. 27, 1987, 8707416

Int. Cl.[5] **A61K** *9/16*

U.S. Cl. 424—493 **12 Claims**

1. A controlled release pharmaceutical formulation for oral administration which comprises discrete units comprising acrivastine or a pharmacologically and pharmaceutically acceptable salt thereof coated with a mixture containing:

(a) a copolymer or polymer containing repeating monomer units selected from alkyl esters of acrylic and methacrylic acids and

(b) ethyl cellulose.

4,954,351

METHOD OF PRODUCING STANDARDIZED POVIDONE IODINE PREPARATIONS AND SUCH PREPARATIONS

Mortimer D. Sackler, Schattdorf; Ronald B. Miller, Basel, both of Switzerland; Erwig O. Pinter; Helmut E. W. Rackur, both of Limburg/Lahn, Fed. Rep. of Germany; Raymond R. Sackler; Richard S. Sackler, both of Greenwich, Conn., and Alfred Halpern, deceased, late of Great Neck, N.Y. (by Marjorie A. Halpern, administratrix), assignors to Euroceltique S.A., Luxembourg

Continuation of Ser. No. 927,841, Nov. 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 802,322, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 585,428, Mar. 2, 1984, abandoned. This application Sep. 22, 1988, Ser. No. 247,876

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307219; Apr. 15, 1983, 3313655

Int. Cl.[5] **A61K** *33/36*

U.S. Cl. 424—667 **9 Claims**

1. A method of producing a povidone iodine preparation having a predetermined concentration of free iodine which is immediately achieved and which remains constant and having predictable microbicidal effectiveness and long duration of action, the method comprising the steps of treating a mixture of povidone iodine and iodine ion in acidic solution with iodate ion to form an acidic solution containing between 2 and 20 ppm of free iodine and having an a available iodine to iodide ratio between 2:1 and 10:1, increasing the pH of said acidic solution to between 5 and 6, and adding additional iodate ion to the thus formed solution in an amount sufficient to maintain the amount of free iodine therein at a concentration of between 2 and 20 ppm, whereby the free iodine concentration is immediately achieved and remains stable for at least 12 months at 20° C.

4,954,352

APPARATUS FOR PRODUCING PARTICLES OF THERMOPLASTIC MATERIAL

Norman E. Luker, Baton Rouge, La., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 9, 1988, Ser. No. 225,059

Int. Cl.[5] **B28B** *11/16;* **B26F** *3/00*

U.S. Cl. 425—296 **16 Claims**

1. Apparatus for producing particles of thermoplastic material comprising:

an extrusion device including a multi-orifice die plate having a face from which extruded material extends;

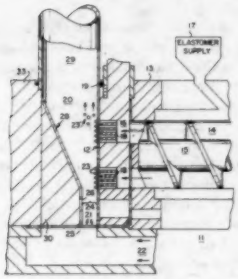
a cutting chamber;

a source of gas coupled to said cutting chamber;

a restricted throat means interposed between said source of gas and said face of said die plate for causing said gas to

pass across said die plate at a velocity sufficient to sever extruded material to form crumb particles;

a sloping wall member within said cutting chamber extending from said restricted throat means towards a material



discharge region of said chamber for forming a product accumulation region in the vicinity of said orifices having an increasing cross-sectional area proceeding from said throat means towards the ones of said orifices nearest to said discharge region.

4,954,353

ANHYDROUS CHEWING GUM WITH IMPROVED STABILITY

Subraman R. Cherukuri, Towaco, N.J.; Gul Mansukhani, Staten Island, N.Y., and Tommy L. Chau, Bridgewater, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 29, 1988, Ser. No. 291,707

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—5 **23 Claims**

1. An anhydrous chewing gum composition resistant to moisture pickup comprising:

(a) a homogeneous mixture of a gum base, a flavoring agent, a sweetening agent and

(b) a hydrophobic softening agent, wherein the hydrophobic softening agent is admixed with the mixture from step (a) to provide moisture resistance to the composition.

4,954,354

PROCESS UTILIZING ALCOHOL OXIDASE

Thomas R. Hopkins, and Dennis S. Banasiak, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 10, 1988, Ser. No. 208,329

Int. Cl.[5] A23B *1/10*; C12G *1/00*; A23L *1/00*; B65D *81/28*

U.S. Cl. 426—8 **12 Claims**

1. A process for removing residual oxygen gas from the gas phase of a closed container comprises contacting the gas phase of a closed dry container wherein a dry food product is stored with an oxygen scavenger consisting essentially of

(a) a dried alcohol oxidase containing agent selected from the group consisting of whole cells, broken cells and cell extracts of methylotrophic yeast or fungi having a moisture content in the range of about 10 to about 30 weight percent; and

(b) at least one suitable alcohol substrate provided as a vapor or a liquid wherein said liquid is provided in the range of about 0.075 to about 0.15 grams of alcohol per liter of atmospheric volume scavenged, wherein said alcohol oxidase containing agent and said suitable substrate are present in an amount sufficient to effect the substantial elimination of said oxygen gas from the gas phase of the closed container.

4,954,355

FEED RAW MATERIAL AND FEED CONTAINING ZERO FIBRE AND PROCEDURE FOR PRODUCING THESE

Asko Haarasilta, Putousrinne 1 D 26, SF-01600 Vantaa; Leo Vuorenlinna, Munkkiniemen puistotie 2 B, SF-00330 Helsinki, and Kalevi Laiho, Vaskihuhdantie 4-6 H 58, SF-00740 Helsinki, all of Finland

Filed Mar. 30, 1988, Ser. No. 175,149

Claims priority, application Finland, Mar. 30, 1987, 871389

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—61 **22 Claims**

9. A process for producing an improved feed material for ruminants; said process including steps of:

(a) providing a dry, zero fibre mixture including:

(i) 80–99% by weight cellulose-containing wood conversion industry zero fibre; and,

(ii) at least 1% and no more than 20% by weight molasses;

(b) dry granulating said zero fibre mixture to form a granulated zero fibre product; and,

(c) admixing said zero fibre product, in an amount of 1–50% by weight, with ruminant feed, to form an admixture.

4,954,356

OVENABLE PACKAGE FOR BACON AND THE LIKE

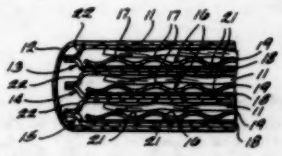
Kenneth C. Kappes, Hartland, Wis., assignor to Milprint, Inc., Milwaukee, Wis.

Continuation of Ser. No. 96,125, Sep. 11, 1987, Pat. No. 4,857,342. This application Aug. 1, 1989, Ser. No. 388,122

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] B65B *25/00*; B65D *81/00*

U.S. Cl. 426—107 **20 Claims**



1. A microwavable package for containing a food product during storage and cooking, said microwavable package comprising:

a bed formed of absorbent material for supporting the food product during storage and cooking, the food product disposed in direct contact with said bed;

a substantially sealed and movable plastic member covering said bed and the food product; and

venting means in said plastic sleeve for permitting the passage of vapor generated during cooking through said plastic member so that said plastic member moves away from said bed and the food product during cooking.

4,954,357

METHOD OF MAKING PIZZA DOUGH

Konstantinos Poulgourss, Box 1975, Tisdale, Saskatchewan, Canada (S0E 1T0)

Filed May 3, 1989, Ser. No. 346,931

Claims priority, application Canada, Aug. 3, 1988, 573700

Int. Cl.[5] A21D *8/00*

U.S. Cl. 426—302 **7 Claims**

1. In the preparation of a pizza dough the improvement comprising flavoring said dough by the steps of:

(1) preparing a concoction by placing a flavour material in warm water until the water absorbs the taste of said material;

(2) assembling the ingredients of a pizza dough and adding the concocted liquid thereto;

(3) mixing the ingredients and concocted liquid in a mixing machine to produce a dough mixture; and

(4) pouring oil over said dough mixture to keep it moist.

4,954,358

MULTIPLICATION INHIBITOR FOR *BACILLUS CEREUS*

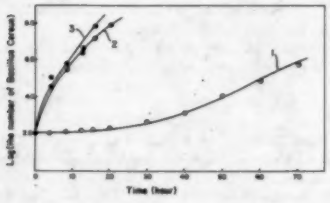
Ryuzo Ueno; Yatsuka Fujita; Munemitsu Yamamoto, and Hiroshi Kozakai, all of Nishinomiya, Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

Filed Dec. 3, 1987, Ser. No. 128,557

Claims priority, application Japan, Dec. 4, 1986, 61-289715

Int. Cl.[5] A21D *4/00*; A61K *37/08*

U.S. Cl. 426—331 **13 Claims**



1. A method of inhibiting multiplication of Bacillus cereus in processed foods, comprising adding an inhibitor composition comprising a Bacillus cereus multiplication inhibitor protamine or a salt thereof to processed food in an amount of 0.001 to 2 percent protamine by weight of the food, wherein inhibition of the multiplication of Bacillus cereus is effected without the addition of heat.

4,954,359

PROCESS FOR THE FAST COOKING OF PASTA

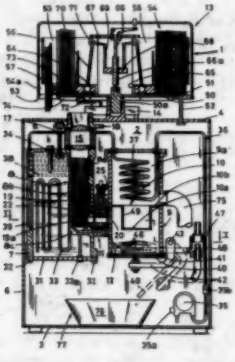
Modesto Pratolongo, Milan, Italy, assignor to Electronics for Industry, Ltd., United Kingdom

Division of Ser. No. 123,110, Oct. 19, 1987, Pat. No. 4,869,160. This application Jun. 7, 1989, Ser. No. 351,610

Claims priority, application Italy, Feb. 18, 1986, 19447/86

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—557 **3 Claims**



1. A process for the fast cooking of pasta, comprising the following steps:

vertically introducing a predetermined amount of pasta into a containing chamber, said pasta being homogenously distributed in the whole section of the containing chamber;

filling the containing chamber with cooking water and saturated wet vapor under pressure, said water and vapor flowing at controlled speed through the whole section of the containing chamber and homogeneously impregnating pasta;

ejecting pasta, water and vapor from the containing chamber and conveying them into a pause chamber having a lower pressure than that created in the containing chamber during the preceding step;

separating excess vapor and cooking water from the pasta;

keeping the pasta in said pause chamber together with a predetermined amount of cooking water for a period of time sufficient for the pasta to partially reabsorb said predetermined amount of cooking water while simultaneously cooking said pasta therein; and

transferring pasta and residual cooking water into a vessel, where cooking of pasta is brought to an end by the complete absorption of residual water.

4,954,360

METHOD OF INHIBITING ICE CRYSTAL GROWTH IN FROZEN FOODS AND COMPOSITIONS

Ronald E. Barnett, R.D. 5, Gage Rd., Brewster, N.Y. 10509

Continuation-in-part of Ser. No. 77,142, Jul. 23, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 218,531

Int. Cl.[5] A23G *9/00*

U.S. Cl. 426—565 **20 Claims**

1. A method of inhibiting ice crystal growth in a frozen food product which comprises adding to the frozen aqueous ingredient mixture prior to freezing an effective ice crystal growth inhibiting amount of a partially delignified plant fiber, a hemicellulose B or mixtures thereof.

4,954,361

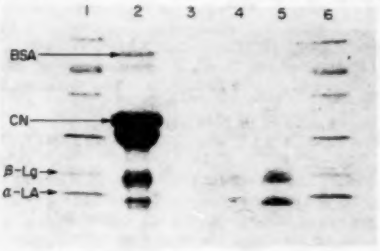
HYPOALLERGENIC MILK PRODUCTS AND PROCESS OF MAKING

Leonard S. Girsh, Melrose Park, Pa., assignor to Immunopath Profile, Inc., Melrose Park, Pa.

Filed Jan. 13, 1989, Ser. No. 297,451

Int. Cl.[5] A23C *9/00*, *11/00*, *21/00*

U.S. Cl. 426—580 **25 Claims**



1. A hypoallergenic milk which has the flavor and smell of natural whole milk comprising:

a permeate of milk, said permeate being substantially free of milk protein and fat, said permeate having been prepared by filtration of whole or skim milk through a filtration membrane without pretreating said milk to denature or hydrolyze the protein contained therein before filtration, which filtration membrane will only allow molecules with a molecular weight less than or equal to about 5 kDa to pass therethrough;

hypoallergenic protein; and

hypoallergenic fat.

4,954,362

PROCESS FOR PREPARING EDIBLE FAT PRODUCT

Leendert H. Wesdorp, Schiedam, and Mattheus Struik, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 101701, Sep. 28, 1987. This application Apr. 4, 1989, Ser. No. 333,390

Claims priority, application European Pat. Off., Sep. 26, 1986, 86201673.0; Sep. 26, 1986, 86201674.8

Int. Cl.[5] A23D *3/00*

U.S. Cl. 426—602 11 Claims

1. Process for preparing an edible fat product comprising the steps of:

(a) emulsifying at least one first fat with a water phase to obtain an emulsion;

(b) adjusting said emulsion to a temperature below 15° C. thereby obtaining a cold water-in-oil emulsion containing at least 1 weight % of crystallized fat; and

(c) mixing said cold water-in-oil emulsion with at least one of a second fat having a slip melting point above that of said first fat, said second fat being maintained at a temperature at which said second fat has a N-value of not more than 25.

4,954,363

COMPOSITIONS AND PROCESS FOR ALFALFA DRYING

Doanld D. Staker, and William S. Kain, both of Cincinnati, Ohio, assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 26,090, Mar. 16, 1987, Pat. No. 4,762,724, which is a continuation-in-part of Ser. No. 769,238, Aug. 26, 1985, abandoned. This application Jul. 14, 1988, Ser. No. 219,107

Int. Cl.[5] H23K *1/00*

U.S. Cl. 426—636 4 Claims

1. An aqueous composition suitable for application to alfalfa to increase the drying rate consisting essentially of

(a) 85 to 99 weight percent water;

(b) 0.10 to 10 weight percent paraffinic or isoparaffinic hydrocarbon;

(c) 0.25 to 10 weight percent methyl ester of a C_{12-18} fatty acid or fatty acid mixture wherein the predominant acids have from 12 to 18 carbon atoms, said methyl ester having an acid value from 5 to 30; and

(d) 0.5 to 5 weight percent potassium or sodium carbonate.

4,954,364

METHOD FOR COATING SUBSTRATES WITH UV CURABLE EPOXYSILICONE COMPOSITIONS

Judith Stein, Schenectady, N.Y.; Tracey M. Leonard, Essex Junction, Vt., and James L. Desorcie, Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1989, Ser. No. 369,799

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—54.1 8 Claims

1. A method for imparting control release characteristics to a paper or plastic substrate, which comprises,

(A) treating the paper or plastic substrate with a UV curable epoxysilicone mixture, and

(B) UV curing the treated substrate until a nonsmear tack-free adherent film is formed,

where the UV curable epoxysilicone mixture comprises by weight,

(C) 100 parts of epoxysilicone having from about 5 to 12 mole percent of condensed epoxyorganosiloxy units based on the total moles of condensed diorganosiloxy units,

(D) an effective amount of a photosensitive polyaryloniumhexafluorometalloid salt and

(E) 0.1 to 50 parts of a member selected from the class consisting of

(i) $C_{(8-20)}$ alkyl phenols

(ii) phenolalkyl substituted organodisiloxanes.

4,954,365

METHOD OF PREPARING A THIN DIAMOND FILM

Richard A. Neifeld, Springfield, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 18, 1989, Ser. No. 451,699

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—53.1 9 Claims

1. Method of preparing a thin diamond film from a substrate immersed in a liquid containing carbon and hydrogen comprising subjecting the substrate to at least one laser pulse.

4,954,366

METHOD FOR THE METALLIZATION OF A LUMINESCENT SCREEN

Antimo Pezzulo, Anagni, and Himanshu Patel, Rome, both of Italy, assignors to Videocolor, Montrouge, France

Filed Oct. 19, 1988, Ser. No. 259,906

Claims priority, application France, Oct. 20, 1987, 87 14430

Int. Cl.[5] B05D *5/06*

U.S. Cl. 427—68 5 Claims

1. A method for the metallization of a luminescent screen comprising the following steps:

depositing a layer of at least one luminophor containing a binder on a transparent face panel;

depositing on said layer a sub-layer consisting of an aqueous emulsion of a water-insoluble resin, the emulsion being neutral or alkaline and being capable of forming a hydrophobic film;

drying of the sub-layer;

depositing on said sub-layer a coating consisting of an aqueous emulsion of a water-insoluble film-forming resin, and at least hydrogen peroxide and a water-soluble polymer;

drying the coating;

depositing a metallic layer, and

volatilizing the binder contained in the luminophor layer, the sub-layer and the coating.

4,954,367

VAPOR DEPOSITION OF BIS-TRIBUTYLTIN OXIDE

Karl H. Bloss, Pittsburgh, and Peter P. Harmon, North Huntington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 219,691

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—109 12 Claims

1. A method of forming a tin oxide coating comprising the steps of:

a. contacting a surface of a substrate in an oxidizing atmosphere with bis-tributyltin oxide and a fluorine-containing compound;

b. maintaining a temperature sufficient to thermally react said bis-tributyltin oxide; and

c. pyrolyzing said bis-tributyltin oxide to deposit a fluorine-containing tin oxide film on said surface.

4,954,368

COATING COMPOSITIONS

Leonard S. G. Hartridge, Windsor; David W. Taylor, Reading, and Roger L. Waters, Bucks, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 144,729, Jan. 14, 1988, Pat. No. 4,868,232, which is a continuation of Ser. No. 4,254, Jan. 5, 1987, abandoned, which is a continuation of Ser. No. 664,032, Oct. 23, 1984, abandoned. This application Apr. 26, 1989, Ser. No. 343,498

Claims priority, application United Kingdom, Nov. 2, 1983, 8329299; Nov. 10, 1983, 8329955; Aug. 2, 1984, 8419720

Int. Cl.[5] B05D *1/28*

U.S. Cl. 427—256 **4 Claims**

1. A method for providing a coating of paint on a substrate with less spattering of the paint wherein the method comprises the steps of

(1) providing a container comprising a tray adapted to receive a paint roller and closable by a lid,

(2) providing in the tray an aqueous structured solid paint which comprises as essential ingredients a latex polymer dispersion, a thickener and a structuring agent selected from natural and synthetic clays, titanium chelates, zirconium chelates, and mixtures thereof so that the paint has either

I

(a) a gel strength of at least 100 g.cm when measured 4 weeks from manufacture and a gel strength of not greater than 400 g.cm when measured 1 year from manufacture and

(b) a viscosity (when measured by a technique, including a preshearing step) in the range 1.5 to 13 poise 4 weeks from manufacture and which remains in this range 24 weeks from manufacture

when it is intended to provide a coating having a relatively smooth non-textured surface

II

(a) a gel strength of at least 100 g.cm when measured 4 weeks from manufacture and a gel strength of not greater than 400 g.cm when measured 1 year from manufacture,

(b) a viscosity (when measured by a technique, including a preshearing step) in the range 1.5 to 50 poise 4 weeks from manufacture and which remains in this range 24 weeks from manufacture

when it is intended to provide a coating having textured, patterned or relief surface,

(3) closing the tray with a lid to permit transport and storage of the solid paint,

(4) removing the lid from the tray to enable the tray to receive a paint roller and

(5) taking up paint from the tray onto a paint roller and applying the taken up paint to the substrate by means of the paint roller.

4,954,369

CHEMICAL DEPOSITION OF COPPER FROM ALKALINE AQUEOUS BATHS

Alfred Oftring; Chung-Ji Tschang, both of Bad Duerkheim; Ekhard Winkler, Mutterstadt; Guenther Gotsmann, Frankenthal, and Klaus Glaser, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 312,926

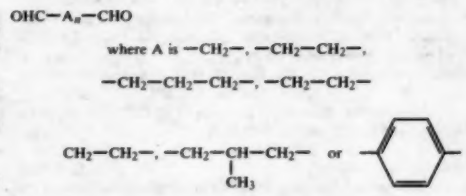
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1988, 3806306

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—430.1 **3 Claims**

1. A process for the chemical deposition of copper from an alkaline aqueous bath which contains a copper salt and a customary assistant and also as a complexing agent a polyacetal obtainable by reacting

(a) a dialdehyde of the formula



$$OHC-A_n-CHO$$

where A is $-CH_2-$, $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$, $-CH_2-CH_2-$

CH_2-CH_2-, $-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-$ or

and n is 0 or 1, with

(b) a polyolcarboxylic acid which contains 2 or more OH groups and has from 4 to 7 carbon atoms, in a molar ratio of (a):(b) of 1:from 0.5 to 3 in the presence of an acidic catalyst which process comprises depositing copper from said bath onto an object in said bath.

4,954,370

ELECTROLESS PLATING OF NICKEL ON ANODIZED ALUMINUM

Issa S. Mahmoud, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1988, Ser. No. 289,994

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—438 **5 Claims**

1. A method of plating an anodized aluminum substrate comprising:

surface activating the substrate;

immersing the substrate in an aqueous neutral bath composed of

nickel sulfate in the range of from about 30 to about 40 grams per liter,

sodium citrate in the range of from about 20 to about 25 grams per liter,

lactic acid in the range of from about 8 to about 12 grams per liter,

dimethylborane in the range of from about 20 to about 25 grams per liter,

deionized water in the amount of from about 800 to about 900 milliliters,

at a temperature of about 40 to about 50 degrees centigrade,

for a period sufficient in duration for plating to a predetermined thickness.

4,954,371

FLASH EVAPORATION OF MONOMER FLUIDS

Angelo Yializis, Tucson, Ariz., assignor to Spectrum Control, Inc., Erie, Pa.

Continuation of Ser. No. 877,175, Jun. 23, 1986, abandoned. This application Jul. 7, 1987, Ser. No. 70,085

Int. Cl.[5] B05D *3/06*; C23C *16/00*

U.S. Cl. 427—44 **23 Claims**

1. A method for continuously supplying a uniform vapor of a polymerizable material, said method comprising:

supplying a continuous liquid flow of said material at a temperature below both the decomposition temperature and the polymerization temperature of said material;

continuously atomizing the liquid flow into a continuous flow of liquid droplets; and

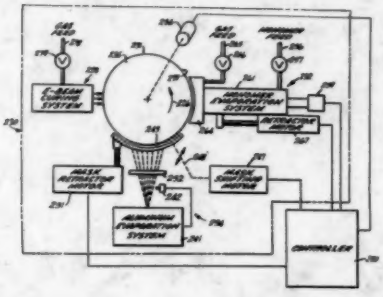
continuously vaporizing said liquid droplets by causing said droplets to contact a heated surface which is maintained at a temperature at or above the boiling point for said material, but below the temperature at which said droplets would undergo pyrolysis before vaporizing.

6. A method for depositing a layer of a polymerizable material on a substrate comprising:

supplying a continuous liquid flow of said material at a temperature below both the decomposition and the polymerization temperature of said material;

continuously atomizing said liquid flow into a continuous flow of liquid droplets;

continuously vaporizing said liquid droplets by causing said droplets to contact a heated surface which is maintained at a temperature at or above the boiling point for said material but below the temperature at which said droplets would undergo pyrolysis before vaporizing;



maintaining at least a portion of said substrate at a temperature which is below the boiling point of said material and in a region which is at a lower pressure than said vaporized material, to provide a positive flow of vaporized material toward said substrate; and

directing the flow of vaporized material onto said substrate.

4,954,372

METAL SURFACE HYDROPHILICIZING PROCESS AND COMPOSITION

Ryohsuke Sako; Akihiko Hasebe; Akira Nishihara, and Hiroshi Okita, all of Kanagawa, Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,945

Claims priority, application Japan, Apr. 20, 1988, 63-98022

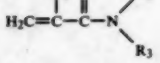
Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—388.2 **18 Claims**

5. A process for forming a hydrophilic surface on a metal substrate, comprising the steps of:

(A) coating the substrate with a film of a fluid aqueous composition consisting essentially of materials selected from the group consisting of water, water-soluble organic solvents, water soluble polymers, polymer crosslinking agents, corrosion inhibitors, fillers, colorants, surfactants, antifoaming agents, leveling agents, and biocides, said fluid aqueous composition comprising:

(1) a first water soluble polymer having a molecular weight of at least about 5,000 and having a chemical structure formally obtainable by polymerizing a mixture of molecules all containing addition-polymerizable carbon-carbon double bonds, wherein at least 40 number percent of the molecules in the mixture have a structure according to the general formual (I)



(I)

wherein R_1 represents H or CH_3; R_2 and R_3 each independently represents H, alkyl having 1 to 4 carbon atoms, benzyl, or hydroxyalkyl having 2 to 3 carbon atoms;

(2) a second water soluble polymer having a molecular weight of at least about 1,000 and having a chemical structure formally obtainable by polymerizing a mixture of molecules all containing addition-polymerizable carbon-carbon double bonds, wherein at least 60 number percent of the molecules in the mixture also contain a moiety selected from the group consisting of carboxyl groups, carboxylate salts, sulfonic acid group, sulfonate salts, phosphonic acid group, phosphonate salts, amino groups, salts of amino groups, and quaternary ammonium groups; and

(3) a water-soluble crosslinking agent which is cosoluble with both (2) and (3),

the weight ratio of component (2) to component (1) in said fluid aqueous composition being in the range from about 0.01 to 4 and the weight ratio of component (3) to component (1) in said fluid aqueous composition being in the range from about 0.01 to about 4; and

(B) heating the coated substrate formed in step (A) for a sufficient time to dry the coating and make it adherent to the substrate.

4,954,373

FIBROUS SUBSTRATES CONTAINING HOT MELT COATINGS MADE FROM A NOVEL PETROLEUM WAX

Richard L. Jones, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 30, 1988, Ser. No. 278,700

Int. Cl.[5] B05D *1/30*

U.S. Cl. 427—389.9 **15 Claims**

1. A process for coating fibrous substrates which comprises:

(a) forming a falling curtain of viscous, molten, thermoplastic wax composition,

(b) causing a fibrous substrate to pass through said curtain of wax so as to deposit the curtain of wax on at least one surface of said fibrous substrate, and

(c) permitting the wax to congeal on the surface of the fibrous substrate; the improvement which comprises employing as the falling curtain of wax a wax composition which comprises:

(1) from about 50 weight percent to about 90 weight percent of a recrystallized 650 distillate heavy intermediate petroleum wax having a boiling point range of from about 155° F. to about 185° F. having a clear color;

(2) from about 10 weight percent to about 30 weight percent of a polymeric hydrocarbon compound having a molecular weight of from about 2,000 to about 100,000 and a melt index of from about 1 to about 250 at 375° F.;

(3) from about 0.01 weight percent to about 15 weight percent of a hydrocarbon resin derived from a C_5 olefin petroleum feedstock or terpene resin wherein said hydrocarbon resin has a softening point of from about 180° F. to about 250° F.; and

(4) from about 0.01 weight percent to about 0.1 weight percent of a petroleum wax soluble, phenolic anti-oxidant.

4,954,374

DECORATIVE MODULE HAVING A CONCAVE FACE

Gilbert Lemire, 1565 Victoria, Suite 209, St-Lambert, Quebec, Canada J4R 1R6

Continuation-in-part of Ser. No. 136,946, Dec. 23, 1987, Pat. No. 4,806,403. This application Dec. 23, 1988, Ser. No. 289,235

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[5] B65D *5/26*

U.S. Cl. 428—34.1 **12 Claims**

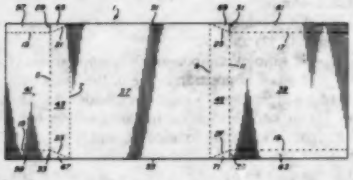
1. A decorative module made of a single sheet of material, which comprises:

a rectangularly shaped concave face derived from an intermediate portion of said sheet of material;

a rearwardly and inwardly directed angled border formed along one side of said concave face to define a male end of said decorative module;

a rearwardly and outwardly directed angled border formed along the other side of said concave face;

means enabling remaining portion of said sheet of material to extend from said rearwardly and inwardly directed angled border to define therewith a female end of said decorative module capable of engaging said male end;



said concave face forming an arc of circle whose height is at least 1/25th the length of the chord of said arc of a circle; so constructed and arranged that said module is self-supporting and capable of being applied against an outer surface by fixation of said remaining portion thereto.

4,954,375

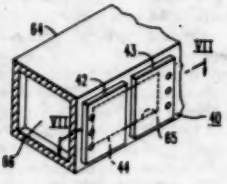
VIBRATION DAMPING APPARATUS

Stanley S. Sattinger, Mount Lebanon, Pa.; Leo K. H. Lu, Cupertino, and Jerry R. Smerecky, Sunnyvale, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 29, 1988, Ser. No. 290,395

Int. Cl.[5] E04B *1/84*

U.S. Cl. 428—34.1 **9 Claims**



1. A vibrationally damped structure, comprising:

(A) a hollow beam structure having a plurality of wall portions;

(B) at least one of said wall portions including a plurality of apertures therethrough;

(C) a plurality of shear damping assemblies operable to absorb energy from unwanted vibrational excitation, with each said shear damping assembly including a plurality of plate members and which extends across a respective one of said apertures with a first said plate member being secured to said wall portion on one side of said aperture and a second said plate members being secured to said wall portion on an opposite side of said aperture.

4,954,376

TWO MATERIAL THREE/FIVE LAYER PREFORM

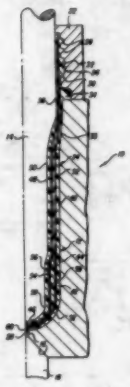
Suppayan M. Krishnakumar, Nashua; Thomas E. Nahill, Amherst; Steven L. Schmidt, and Wayne N. Collette, both of Merrimack, all of N.H., assignors to Continental Pet Technologies, Inc., Norwalk, Conn.

Filed Dec. 30, 1988, Ser. No. 292,440

Int. Cl.[5] B65D *1/00*

U.S. Cl. 428—35.7 **10 Claims**

1. An injection molded plastic perform for blow molding to form a container, said preform being in part formed in three layers and in part five layers, said preform comprising a neck finish portion, a shoulder forming portion, a body forming portion, and a base forming portion, at least said body forming portion and said base forming portion having inner and outer layers formed of a primary material and separated by a layer of a secondary material; said preform being improved in that in said base forming portion a central part of said secondary material is replaced by a core layer of material other than and



less costly than said secondary material, thus producing said five layer part, said preform at least in said body forming portion being formed of only three layers with said secondary material forming a relatively thick core layer.

4,954,377

LOAD BEARING CONNECTIVE DAMPER

Eugene C. Fischer, Stevensville, and Roger M. Crane, Arnold, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1988, Ser. No. 274,587

Int. Cl.[5] B32B *25/02*; B66C *1/18*; F16D *3/56*; F16F *1/36*

U.S. Cl. 428—36.1 **20 Claims**

1. A load bearing connective damper, comprising:

a multidimensionally braided textile shape having a multiplicity of strands forming a multiplicity of interstrand spaces; and

a viscoelastic material disposed in a contiguous relationship with said strands and said interstrand spaces.

4,954,378

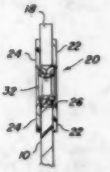
REPAIR KIT FOR SHOWER CURTAIN AND THE LIKE

Allan L. Goodman, 685 Wedgewood Rd., Bethlehem, Pa. 18017

Filed Nov. 18, 1988, Ser. No. 272,941

Int. Cl.[5] B32B *1/04*

U.S. Cl. 428—63 **8 Claims**



1. A repair and reinforcing means for use in repairing tears in sheet material or reinforcing said sheet material about one or more apertures located adjacent the top edge of said sheet material, said apertures being used to suspend said sheet material from a suspension means using one or more hangers con-

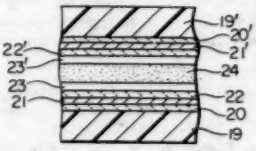
necting the suspension means to the sheet material at said apertures, said repair and reinforcing means comprising substantially circular, thin, pliable disc members of uniform diameter having inner and outer surfaces and a centrally located hole through each disc member, each said disc member extends inwardly a uniform distance into the centrally located hole and is clamped one to the other by a rivet having a central bore forming a manipulatable reinforcing unit for insertion through one of said apertures in the sheet material adjacent a tear such that the inner surface of each disc member lies in proximate juxtaposition over the sheet material surrounding and defining said apertures and bonding means for adherence of said inner surface of each disc member to the overlaid outer surface of the sheet material.

4,954,379

INFORMATION RECORDING THIN FILM AND METHOD FOR RECORDING INFORMATION

Tetsuya Nishida, Koganei; Motoyasu Terao, Tokyo; Yasushi Miyauchi, Sakai, and Shinkichi Horigome, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 946,843, Dec. 29, 1986, abandoned.
This application Jun. 14, 1989, Ser. No. 368,060
Claims priority, application Japan, Dec. 27, 1985, 60-292635
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 **52 Claims**



1. An information-recording thin film capable of changing an atomic configuration upon exposure to a recording beam, formed on a substrate directly or through a protective layer composed of at least one of inorganic materials and organic materials, an average composition in the film thickness direction of the information-recording thin film being represented by the following general formula:

$$A_XB_YC_ZGe_\alpha Te_\beta$$

wherein X, Y, Z, α and β are in a range of $1 \leqq X < 30$, $0 \leqq Y \leqq 25$, $40 < Z+\alpha \leqq 65$ and $35 \leqq \beta < 60$ in atomic percentage; C is at least one element of Sb and Sn; B is at least one element of Tl, halogen elements and alkali metal elements; and A is Se; and wherein said information-recording thin film has a thickness of 15 to 350 nm.

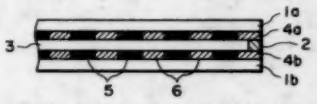
4,954,380

OPTICAL RECORDING MEDIUM AND PROCESS FOR PRODUCTION THEREOF

Osamu Kanome, Kawasaki, and Takayoshi Tsutsumi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,543
Claims priority, application Japan, Nov. 27, 1987, 62-297482; Jan. 18, 1988, 63-006948; Jan. 18, 1988, 63-006949
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 **15 Claims**

1. An optical recording medium, comprising a transparent substrate and an optical recording layer disposed on the substrate, wherein said optical recording layer comprises a data recording region and a tracking region having an optic la characteristic different from that of the data recording region



for guiding a laser beam for recording and reproduction, said tracking region being free of unevenness.

4,954,381

PREPARATION OF POROUS SUBSTRATES HAVING WELL DEFINED MORPHOLOGY

Israel Cabasso, Syracuse, N.Y., and Moshe Levy, Rehovot, Israel, assignors to The Research Foundation of the State University of New York, Albany, N.Y.

Continuation of Ser. No. 947,929, Dec. 30, 1986, abandoned.
This application Mar. 21, 1988, Ser. No. 171,497
Int. Cl.[5] B01J *13/02*; B29D *7/00*; B32B *3/12*
U.S. Cl. 428—116 **21 Claims**

1. A method of making a microporous membrane having a preselected pore structure, the diameters of the pores being within a preselected range, the method comprising:

a. providing a solution of polymer (A) in an organic solvent, said polymer (A) having at least about 5% by weight of one or more water-soluble groups on its polymer chain or pendant to the backbone of the polymer (A) and also having one or more functional groups capable of reacting, complexing or polymerizing with polymer (B);

b. providing a solution of a polymer (B) in an aqueous solution which is immiscible in said organic polymer (A) solution, said polymer (B) having at least about 5% by weight of at least one functional group which can react, complex, or polymerize with polymer (A), or, said polymer (B) is capable of coagulating in the presence of polymer (A);

c. uniformly dispersing the organic polymer (B) solution in the water-soluble polymer (A) solution to form a multiplicity of micro-spherical droplets of the polymer (A) solution enveloped by a skin composed of the product of reaction of polymers (A) and (B) or the coagulated polymer (B), said polymer (A) solution droplets being uniformly dispersed within a continuous phase comprised of said organic polymer (B) solution;

d. evaporating the organic solvent to form a honeycomb-like structure comprised of said micro-spherical droplets uniformly dispersed within and held together by a solid continuous phase of said polymer (B); and

e. dehydrating the honeycomb-like structure which cracks the exposed surfaces of the micro-spherical droplets and forms the microporous membrane comprised of a solid continuous phase of polymer (B) having a network of pores uniformly dispersed therein, with no overlapping pores, the pores at the surface having preselected sizes between about submicron and about 10 microns in diameter.

14. A microporous membrane having a preselected pore structure, the diameter of the pores being within a preselected range, said membrane comprised of a solid continuous phase of polymers (A) and (B) configured to have a bee-hive morphology defining a network of pores, with no overlapping pores, the pores at the surface having preselected sizes between submicron and about 10 microns in diameter said polymer (A) having at least about 5% by weight of one or more water-soluble groups on its polymer chain or pendant to its back-bone and also having one or more functional groups capable of reacting, complexing or polymerizing with polymer (B), and said polymer (B) having at least about 5% by weight of at least one functional group which can react, complex or polymerize

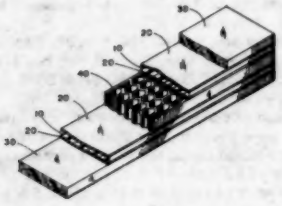
with polymer (A), or said polymer (B) being capable of coagulating in the presence of polymer (A).

4,954,382

INTERLEAF LAYER IN FIBER REINFORCED RESIN LAMINATE COMPOSITES

R. Scott Riefler, Belair, and John W. Powers, Jarrettsville, both of Md., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 1, 1988, Ser. No. 264,309
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—116 **6 Claims**



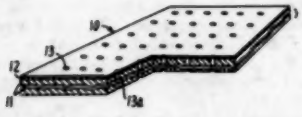
1. In a laminated composite comprising fiber reinforced thermosetting resin layers and at least one interleaf of thermoplastic resin film between two layers of which one is a fiber reinforced thermosetting resin layer and the other is either a honeycomb core or a second fiber reinforced thermosetting resin layer in said composite, the improvement wherein said thermoplastic resin film is coated on both sides with thermosetting adhesive resin.

4,954,383

PERFORATED GLUE THROUGH FILMS

Robert N. King, Sunnyvale, and Gerald R. Behling, Santa Clara, both of Calif., assignors to Southwall Technologies, Inc., Palo Alto, Calif.

Filed Jul. 29, 1988, Ser. No. 225,743
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—131 **14 Claims**



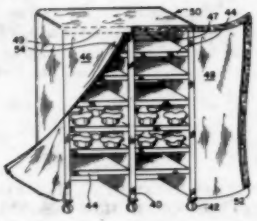
1. In a plastic sheet product comprising a 0.25 to 20 mil thick metallizable plastic sheet substrate having deposited on one or both of its sides a coating comprising an electrically conductive metal layer, said metal layer being from 5 nm to 500 nm in thickness, the improvement comprising a plurality of perforations through said plastic sheet and said coating, said perforations being selected from a plurality of slits, said slits being not greater than 2 cm in length and spaced not more than 1 cm from one another and from a plurality of holes said holes being of a size and density such that the holes constitute from about 1% to about 90% of the surface area of said plastic sheet.

4,954,384

FOOD RACK COVER

Carol Hartwell, 16877 Orchard Ridge, Hazel Crest, Ill. 60429

Continuation of Ser. No. 290,030, Dec. 27, 1988, abandoned. This application Jan. 10, 1990, Ser. No. 463,921
Int. Cl.[5] B32B *3/06*; B65D *65/26*
U.S. Cl. 428—100 **7 Claims**



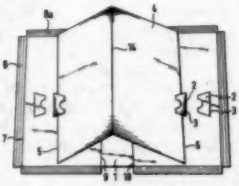
1. A protective cover for use on a rack adapted for holding one or more trays of food items, the cover being a single layer of air-pervious canvas cloth in the form of an open bottom hood and being divided at one or more locations to form two separable mating edge portions and having non-metallic fastening means joining said separable edge portions, said cover having a configuration conforming substantially to the configuration of the rack on which it is used and being of a size to fit over said rack so as to form an open bottom hood thereover and substantially enclose and protect food items held within said rack.

4,954,385

CARTON PAD

Heinz Sämann, Karlsruhe, Fed. Rep. of Germany, assignor to Haarkosmetik and Parfumerien, Fed. Rep. of Germany

Filed Oct. 18, 1988, Ser. No. 259,276
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 8714015
Int. Cl.[5] B65D *81/02*; B32B *3/10*
U.S. Cl. 428—131 **10 Claims**



1. A carton pad, comprising

a base portion having dimensions essentially corresponding to a base area of the carton and comprising several tabs arranged in a row thereon,

each said tab being joined to said base portion along a substantially straight side thereof, and being otherwise free and bendable out of a plane substantially parallel to a surface of said base portion,

each said tab being arranged with said substantially straight side thereof extending substantially perpendicularly to a direction in which said row of said tabs extends,

said row of said tabs being divided into two separate row sections, and

a gabled support of variable gable angle, having an edge for engaging a respective tab of one of said row sections and an opposite edge for engaging a respective tab of the other of said row sections,

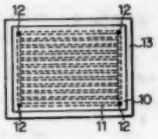
with respective said edges of said support being supported along said straight sides of said respective tabs and engaged with the same.

4,954,386

JOINED CERAMIC-METAL COMPOSITE SUBSTRATE AND METHOD FOR PRODUCTION THEREOF

Nobuyuki Mizunoya; Hiroshi Komorita, both of Kanagawa; Tadashi Tanaka, Chiba, and Kazuo Matsumura, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 8, 1988, Ser. No. 281,365
Claims priority, application Japan, Dec. 18, 1987, 62-320741
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—137 11 Claims



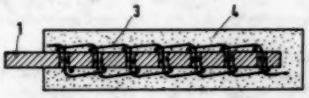
1. A joined ceramic-metal composite substrate comprising a ceramic substrate having opposite surfaces and a copper sheet having a face directly joined to one of the surfaces of the ceramic substrate, at least one through hole in the copper sheet, and at least one groove on a portion of the face of the copper sheet, the face including a groove-free marginal area completely surrounding said portion.

4,954,387

COMPOSITE MATERIAL OF METAL AND PLASTIC

Seigfried Sikorski, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,792
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718676
Int. Cl.[5] B32B *3/24, 7/08, 15/08*
U.S. Cl. 428—138 10 Claims



1. A composite material comprising a flat metal substrate provided with a plurality of apertures distributed therein, a body of plastic material in which said flat metal substrate is embedded and a plurality of reinforcing fibers on said substrate and wound through said apertures, said reinforcing fibers being embedded with said substrate in said plastic material and being substantially out of contact with said substrate.

4,954,388

FABRIC REINFORCED COMPOSITE MEMBRANE

Robert S. Mallouk, Box 332, R.D. #1, Chadds Ford, Pa. 19317; Phillip A. Branca, 132 Country Flower Rd., Newark, Del. 19711, and Randal L. Perry, 1006 Timberwyck Rd., Wilmington, Del. 19810

Filed Nov. 30, 1988, Ser. No. 278,224
Int. Cl.[5] B32B *27/14*
U.S. Cl. 428—198 27 Claims

1. A multilayer composite membrane comprising a synthetic fabric bonded at points of contact to one side of a layer of porous, expanded polytetrafluoroethylene (EPTFE), said EPTFE layer having a continuous perfluoro ion exchange

polymer film laminated thereto on the side opposite said one side, said fabric and porous EPTFE having a coating on at least a portion of the internal and external surfaces thereof of a perfluoro ion exchange resin.

4,954,389

MULTI-LAYER ELECTRICALLY CONDUCTIVE ARTICLE

Ramadas U. Acharya, South Bend, and Lawrence I. Hill, Granger, both of Ind., assignors to Uniroyal Plastics Company, Inc., Mishawaka, Ind.

Filed Jul. 5, 1989, Ser. No. 375,764
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—212 33 Claims

1. A multi-layer conductive article comprising a first layer of a thermoplastic polymer having a volume resistivity of between about 10^7 and 10^{12} ohm-cm, a second layer in direct physical and electrical contact with said first layer of a conductive thermosetting material having a surface resistance from 100 to 900 ohms/square, and a third layer in direct physical and electrical contact with said second layer of an expanded thermoplastic polymer having a volume resistivity of 10^7 to 10^{12} ohm-cm so that said article is capable of dissipating static electric charges which are impressed thereupon.

4,954,390

THERMAL TRANSFER RECORDING MEDIUM

Kunihiro Koshizuka, and Takao Abe, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,877
Claims priority, application Japan, Oct. 13, 1987, 62-257886
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—212 20 Claims

1. A thermal transfer recording medium comprising a support having thereon at least two heat softening layers in the order of a first heat softening layer and a second heat softening layer, wherein at least one of said first and second heat softening layers contains a colorant, and said second heat softening layer contains a heat fusible substance in an amount of from 15% to 50% by weight; a thermoplastic resin in an amount of from 20% to 80% by weight; and a tackifier in an amount of from 5% to 35% by weight;

said heat fusible substance being a vegetable wax, animal wax, petroleum wax, mineral wax, higher fatty acid, higher alcohol, amide, higher amine, or higher fatty acid ester, or a combination thereof;

said thermoplastic resin being a polyamide resin, polyester resin, polyurethane resin, polyolefin resin, acrylic resin, vinyl chloride resin, cellulose resin, ionomer resin, a diene copolymer, natural rubber, isoprene rubber, chloroprene rubber, phenol resin, cyclopentadiene resin, an aromatic hydrocarbon resin, or a mixture thereof; and,

said tackifier being a rosin selected from the group consisting of an unmodified rosin, a hydrogenated rosin, a rosin maleic resin, a polymerized rosin, and rosin phenol resins; a terpene resin; or a petroleum resin.

4,954,391

HIGH DENSITY POLYETHYLENE TYPE TRANSPARENT FILM AND PROCESS FOR PRODUCTION THEREOF

Terumitsu Kotani, Kawasaki; Toshio Taka, Fujisawa, and Yoshimasa Saito, Kawasaki, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00566, § 371 Date Jul. 7, 1987, § 102(e) Date Jul. 7, 1987, PCT Pub. No. WO87/02933, PCT Pub. Date May 21, 1987

PCT Filed Nov. 7, 1986, Ser. No. 80,514

Claims priority, application Japan, Nov. 7, 1985, 60-248079; Nov. 25, 1985, 60-262672; Nov. 25, 1985, 60-262673; Jun. 3, 1986, 61-127206

Int. Cl.[5] C08L *23/04*

U.S. Cl. 428—220 14 Claims

1. A film having a thickness of 10 to 200 μm comprised of high density polyethylene having a density of 0.935 g/cm^3 or more and having an MFR of 0.1 g/10 min or less, said high density polyetheylene type film having a film surface roughness of 0.001 to 0.15 μm, a coefficient of C axis orientation of the crystals in the film (Fc) of 0.10 to 0.50, a difference Δn of the birefringence of the amorphous portions and crystalline portions in the form of 0.1000 to 0.1070, an impact strength of 250 kg-cm/mm or more and a transparency of a haze of less than 10%, said film being produced by passing an original material film, formed using high density polyethylene having a density of 0.935 g/cm^3 or more by inflation at a blow ratio of 3 or more, through at least three heating rolls under temperature conditions such that the temperature of the second from the last heating roll R_2 is set higher than the temperatures of the first, or third from the last, heating roll $R_1$and the last heating roll R_3, and the temperature of R_2 is set at 105° C. or more but below the melting point of said film.

4,954,392

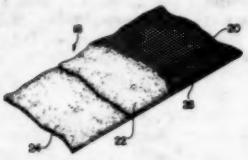
CHEMICAL SUIT LINER

Stanley Goldberg, Providence, R.I., assignor to Duro Industries, Inc., Fall River, Mass.

Filed Dec. 1, 1989, Ser. No. 444,766

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—244 5 Claims



1. A chemical suit liner comprising an air permeable fabric layer, a foam backing bonded to said fabric layer and completely covering a surface thereof, said foam backing being impregnated with a chemical that prevents penetration of harmful gaseous vapors therethrough, said foam backing consisting of a plurality of foam layers laminated to each other.

4,954,393

POLYMERIC FILMS

Mark A. Jones, Bridgwater, England, assignor to Courtaulds Films & Packaging (Holdings) Ltd., Somerset, England

Filed Apr. 21, 1989, Ser. No. 341,761

Claims priority, application United Kingdom, May 17, 1988, 8811643

Int. Cl.[5] B32B *27/40, 27/32;* D04H *1/08*

U.S. Cl. 428—288 10 Claims

1. A multilayer polymeric film comprising a layer of a nylon polymer having a Vicat A (DIN 53460) softening point of not more than 170° C. and being substantially impermeable to styrene, and a layer of weldable synthetic plastics composition bonded to one side of the layer of the nylon polymer and an impregnable fibrous mat bonded directly to the other side of the layer of the nylon polymer.

4,954,394

PHENOLIC RESIN COMPOSITIONS

Francois Boinot, Lievin; Michel Cousin, Loison-sous-Lens; André Hochin, Bruay-en-Artois, and Nicolas Meyer, Lens, all of France, assignors to Norsolor, Paris la Defense, France

Continuation of Ser. No. 118,063, Nov. 6, 1987, Pat. No. 4,912,178, which is a continuation of Ser. No. 762,482, Aug. 5, 1985, abandoned. This application Jan. 22, 1990, Ser. No. 468,413

Claims priority, application France, Aug. 3, 1984, 84 1227

Int. Cl.[5] D04H *1/58*

U.S. Cl. 428—289 5 Claims

1. A prepeg mat comprising a fiber mat impregnated with a phenol-formaldehyde resole resin having a formaldehyde-to-phenol ratio of 1.2–2.5 and based on the resole resin from 5 to 60% by weight of an additive containing at least 20% by weight of a lithium metaborate or an alkaline earth metal borate.

4,954,395

RECORDING MEDIUM

Kenji Hasegawa, Isehara; Takahiro Mori, Ayase, and Masahiko Higuma, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,265

Claims priority, application Japan, Apr. 10, 1987, 62-87095; Mar. 31, 1988, 63-79263

Int. Cl.[5] B41M *5/00*

U.S. Cl. 428—318.4 34 Claims

1. A recording medium comprising a non-porous ink-retaining layer and a porous ink-transporting layer laminated on a substrate in this order, said ink-transporting layer comprising (i) at least one of a surfactant and a penetrant, and (ii) a material which is capable of fixing a colorant contained in an ink, which colorant remains in said ink-transporting layer after application of said ink to said recording medium.

4,954,396

POLYESTER FILM COATED IN-LINE WITH AN SILANE

Howard W. Swofford, Taylors; Sandra W. Rice, Greer; Grover L. Farrar, Greenville, all of S.C., and David Rudd, Naples, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 240,701, Sep. 6, 1988. This application Jun. 13, 1989, Ser. No. 366,051

Int. Cl.[5] B32B *27/08, 27/36*

U.S. Cl. 428—340 17 Claims

1. An oriented polyester film having a primer coating composition on at least one side thereof, said primer coating composition comprising the dried residue of a hydrolyzed aminosilane compound having the formula in the unhydrolyzed state:

$$(R^1)_a Si(R^2)_b(R^3)_c$$

wherein R^1 is a functional group with at least one primary amino group, R^2 is a hydrolyzeable group selected from the group consisting of a lower alkoxy group having 1–8 carbon atoms, C_1 to C_8, an acetoxy group, or a halide group, and R^3 is a nonreactive, nonhydrolyzeable group selected from the group consisting of a lower alkyl having 1–8 carbon atoms, or a phenyl group; with (a) being greater than or equal to 1; (b) being greater than or equal to 1; (c) being greater than or equal to zero, and with $a+b+c=4$, said primer coating composition being applied in-line to said polyester film prior to heat setting said film at a weight effective to improve the adhesion of one or more extrusion coated polymers to said polyester film.

4,954,397

LIGHT RECEIVING MEMBER HAVING A DIVIDED-FUNCTIONALLY STRUCTURED LIGHT RECEIVING LAYER HAVING CGL AND CTL FOR USE IN ELECTROPHOTOGRAPHY

Hiroshi Amada; Tatsuyuki Aoike; Takehito Yoshino, all of Nagahama, and Ryuji Okamura, Shiga, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 111,768, Oct. 23, 1987, abandoned. This application Oct. 18, 1989, Ser. No. 423,680

Claims priority, application Japan, Oct. 27, 1986, 61-255114; Oct. 29, 1986, 61-258946; Oct. 31, 1986, 61-261153; Nov. 1, 1986, 61-261129; Nov. 4, 1986, 61-262451; Nov. 5, 1986, 61-264351; Nov. 6, 1986, 61-264293; Nov. 7, 1986, 61-266315

Int. Cl.[5] G03G *5/085*

U.S. Cl. 430—58 44 Claims

1. A light receiving member for use in electrophotography comprising a substrate for electrophotography and a light receiving layer having, in sequence, (i) a charge carrier generation layer and (ii) a charge carrier transport layer on said substrate, said charge carrier generation layer (i) being formed of a non-single-crystal material substantially consisting of silicon atoms as the main constituent atoms and at least one kind selected from the group consisting of hydrogen atoms and halogen atoms in a total amount of 1 to 40 atomic percent and said charge carrier transport layer (ii) being formed of a non-single-crystal material containing silicon atoms as the main constituent atoms, carbon atoms, a conductivity controlling element capable of providing p-type conductivity or n-type conductivity in an unevenly distributed state in the thickness direction and at least one kind selected from the group consisting of hydrogen atoms and halogen atoms.

4,954,398

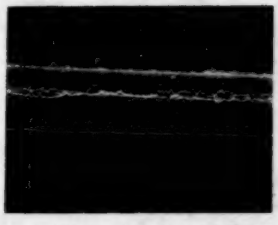
MODIFIED GROOVED POLYESTER FIBERS AND PROCESS FOR PRODUCTION THEREOF

Shriram Bagrodia, Kingsport, and Bobby M. Phillips, Jonesborough, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 157,551, Feb. 16, 1988, Pat. No. 4,842,792. This application Jan. 23, 1989, Ser. No. 299,904

Int. Cl.[5] D02G *3/00*

U.S. Cl. 428—400 18 Claims



1. A fiber comprising a polyester material wherein said fiber has formed therein and extending along the length thereof at least one continuous groove, wherein the mean EB Roughness at the bottom of said groove is about 10% to about 600% higher than the mean EB Roughness outside said groove and the EB Roughness outside said groove is about 0.06μ to about 0.20μ, and wherein said fiber has $L_1/L_2 > 1.2$, where L_1 and L_2 are the respective major and minor axes of the cross-section.

4,954,399

POROUS POLYMER PARTICLES AND PREPARATION METHOD THEREOF

Sumio Tani, Neyagawa; Kazuhiko Kogoh, Osaka; Yuri Nozaki, Kurashiki, and Kunihiro Oshima, Osaka, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

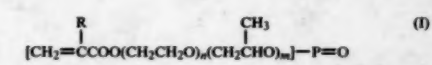
Continuation of Ser. No. 256,805, Oct. 12, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,479

Claims priority, application Japan, Oct. 13, 1987, 62-257896

Int. Cl.[5] C08F *30/02*

U.S. Cl. 428—402 8 Claims

1. Porous polymer particles prepared by the process of polymerizing monomers comprising a compound according to formula (I):



(I)

wherein R is hydrogen or methyl, n is 0 to 30, m is 0 to 30, with the proviso that $m+n>1$,

and a hydrophilic monomer polymerizable with said compound according to formula (I),

wherein the weight ratio of the compound according to formula (I) and the hydrophilic monomer is between 50:50 and 10:90, and

wherein said pore size of said particles is between 30 and 5000 Å.

4,954,400

ARTICLES UTILIZING ACETAL COPOLYMER BONDING RESINS

George L. Collins, Maplewood; Hongkyu Kim, Basking Ridge, and William M. Pleban, Stanhope, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Oct. 11, 1988, Ser. No. 255,569

Int. Cl.[5] B32B *27/38;* C08G *2/10*

U.S. Cl. 428—414 13 Claims

1. An article comprising elements having surfaces bonded together by a bonding resin which is an elastomeric copolymer of about 15 to 45 mol % of trioxane and about 55 to 85 mol % of 1,3-dioxolane based on the total of trioxane and 1,3-dioxolane, and about 0.005 to 0.15 wt. % of 1,4-butanediol diglycidyl ether or butadiene diepoxide as a bifunctional monomer, based on the total weight of copolyer, said elastomeric copolymer being substantially non-crystalline in the unstretched state at room temperature.

4,954,401

PROCESS OF CURING METHYLHYDROSILOXANES

Anthony Revis, Saginaw County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 11, 1989, Ser. No. 392,320

Int. Cl.[5] B32B *27/36*

U.S. Cl. 428—412 18 Claims

1. A process of curing and cross-linking methylhydrosiloxanes comprising contacting and forming a mixture of an allyl ester with at least one methylhydrosiloxane in the presence of a Group VIII metal catalyst, and heating the mixture of the allyl ester, the methylhydrosiloxane, and the Group VIII metal catalyst, in the presence of ambient moisture until the methylhydrosiloxane becomes cured and cross-linked.

4,954,402

EROSION RETARDER FOR REFRACTORY CORNERS

James L. Houston, 4329 S. Lakewood, Tulsa, Okla. 74135

Filed Aug. 28, 1989, Ser. No. 399,597

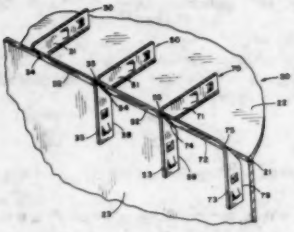
Int. Cl.[5] E04C *5/01*

U.S. Cl. 428—597 10 Claims

1. A bracket for use in anchoring refractory material along a corner of a refractory over which fluid flows, comprising:

horizontal means for embedding in the refractory material disposed on the horizontal portion of the refractory corner;

upright means for embedding in the refractory material disposed on the vertical portion of the refractory corner; and



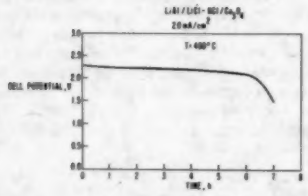
baffle means integrally connecting said horizontal means and said upright means for embedding in the refractory material disposed on the corner portion of the refractory corner.

4,954,403

HIGH TEMPERATURE MOLTEN SALT THERMAL ELECTROCHEMICAL CELL

Edward J. Plichta, Howell, and Wishvender K. Behl, Ocean, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 12, 1990, Ser. No. 478,796
Int. Cl.[5] H01M *4/36, 6/36*
U.S. Cl. 429—103 **5 Claims**



1. A high temperature molten salt thermal electrochemical cell including a lithium-aluminum alloy as the anode, a cathode of cobalt oxide (Co_3O_4) spaced from said anode, and a separator including lithium chloride-potasium chloride eutectic electrolyte in the space between said anode and said cathode.

4,954,404

DEVELOPING METHOD AND DEVICE AND COLOR IMAGE FORMING METHOD AND APPARATUS USING SAME

Masahiro Inoue, Yokohama; Hatsuo Tajima, Matsudo; Yuji Sakemi, and Kenji Okado, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

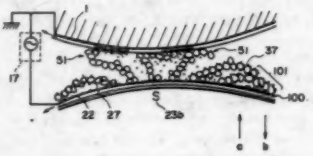
Filed Oct. 3, 1988, Ser. No. 251,780
Claims priority, application Japan, Oct. 5, 1987, 62-252046
Int. Cl.[5] G03G *13/01, 13/09*
U.S. Cl. 430—45 **28 Claims**

8. A color image forming method, comprising:

forming sequentially developed images in different colors by repeating reverse development for depositing toner particles on a light potential area of an electrostatic latent image formed on an image bearing member, said reverse development including,

forming a layer of a developer on a developer carrying member behind which magnetic field generating means is disposed, the developer including the toner particles and magnetic carrier particles for charging the toner particles to a polarity which is the same as a polarity of a dark potential of the image bearing member;

carrying the developer layer to a developing position where



the developer carrying member and the image bearing member are opposed; and

forming an alternating electric field in the developing position;

wherein a relative volumetric ratio Q (%) of the magnetic carrier particles in the developing position satisfies:

$$15.0 \leq Q \leq 28.0$$; and

superimposing the plural color developed images.

4,954,405

PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY COMPRISING SQUARYLIUM CONTAINING GENERATOR LAYER AND HYDRAZONE CONTAINING TRANSPORT LAYER

Yoshinobu Sugata; Noboru Furusho, and Tomomi Tanaka, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

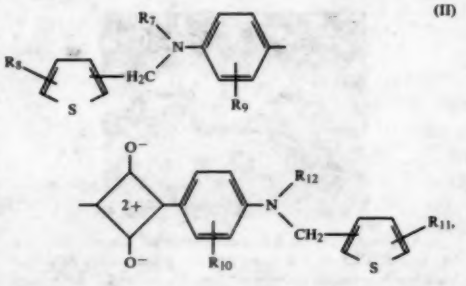
Filed Jun. 28, 1989, Ser. No. 373,684
Claims priority, application Japan, Jun. 30, 1988, 63-163017
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—58 **3 Claims**

1. A photoconductor for electrophotography, comprising:

an electrically conductive substrate; and

a laminate formed on said substrate and including a charge generating layer and a charge transporting layer;

wherein said charge generating layer includes at least one squarylium compound represented by the following general formula (II) as a charge generating substance:

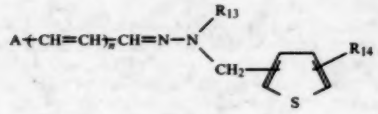


(II)

wherein each of R7 and R12 stands for one of an alkyl group, an aryl group, an aralkyl group, and an alkenyl group, each of which groups may be or may not be substituted, each of R8 and R11 stands for one of a hydrogen atoms, a halogen atom, an alkyl group and an aryl group,

both of which groups may be or may not be substituted, and each of **R9** and **R10** stands for one of a hydrogen atom, a halogen atom, a hydroxy group, an alkyl group and an alkoxy group; and

wherein said charge transporting layer includes at least one hydrazone compound represented by the following general formula (III) as a charge transporting substance:



(III)

wherein A stands for one of an aryl group and a hetelocyclic group, both of which may be or may not be substituted, **R13** stands for one of an alkyl group and an aryl group, both of which may be or may not be substituted, **R14** stands for one of a hydrogen atom, a halogen atom, an alkyl group and an aryl group, both of which groups may be or may not be substituted and n stands for an integer which is 0 or 1.

4,954,406

ELECTROPHOTOGRAPHIC PLATE INCLUDING AN UNDERCOATING LAYER HAVING A SMOOTH SURFACE

Keiichi Endo; Yasushi Shinbo; Akira Kageyama; Yasuo Katsuya; Chihiro Kato; Masato Fukasawa, and Makoto Sekine, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,557

Claims priority, application Japan, Nov. 2, 1987, 62-277737

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—60 **7 Claims**

1. An electrophotographic plate comprising an electroconductive substrate, an undercoating layer formed on the substrate, and a photosensitive layer formed on the undercoating layer, said undercoating layer having a smooth surface when observed by a scanning electron microscope and an electric conductivity of at least $2\times10^{-14}\ \Omega^{-1}\cdot cm^{-1}$; said undercoating layer containing a polyamide resin which has an amido group concentration of 3.0×10^{-3} equivalent weight/g or less.

4,954,407

ELECTROPHOTOGRAPHIC PHOTORECEPTOR COMPRISING BINDER RESIN CONTAINING ACIDIC GROUPS

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

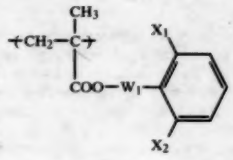
Filed Sep. 29, 1989, Ser. No. 414,334

Claims priority, application Japan, Sep. 30, 1988, 63-244417; Nov. 8, 1988, 63-280391; Nov. 17, 1988, 63-288971

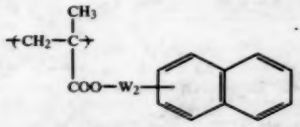
Int. Cl.[5] G03G *5/087*

U.S. Cl. 430—96 **11 Claims**

1. An electrophotographic photoreceptor comprising a support having thereon at least one photoconductive layer containing at least inorganic photoconductive particles and a binder resin, wherein said binder resin has a weight average molecular weight of from 1×10^3 to 5×10^4 and comprises (A) at least one resin comprising, as a polymerization component, (a-i) not less than 30% by weight of at least one repeating unit represented by formula (I) or (II):

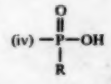


(I)



(II)

wherein X_1 and X_2, which may be the same or different, each represents a hydrogen atom, a hydrocarbon group having form 1 to 10 carbon atoms, a chlorine atom, a bromine atom, $-COY_1$ or $-COOY_2$, wherein Y_1 and Y_2 each represents a hydrocarbon group having from 1 to 10 carbon atoms, provided that both X_1 and X_2 do not simultaneously represent a hydrogen atom; and W_1 and W_2 each represents a bond or a linking group containing from 1 to 4 linking atoms which connects —COO— and the benzene ring, with at least one acidic group selected from the group consisting of (i) $-PO_3H_2$, (ii) $-SO_3H$, (iii) —COOH,



(iv)

wherein R represents a hydrocarbon group having from 1 to 10 carbon atoms or —OR', wherein R' represents a hydrocarbon group having from 1 to 10 carbon atoms, and (v) a cyclic acid anhydride-containing group, being bonded to only one of the terminals of the polymer main chain thereof.

4,954,408

POLYSILOXANE CROSSLINKED STYRENE/BUTADIENE COPOLYMERS

Michael K. Georges, Guelph, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 20, 1989, Ser. No. 325,715

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[5] G03G *9/10*

U.S. Cl. 430—108 **19 Claims**

1. A toner composition comprised of a crosslinked polysiloxane styrene/butadiene copolymer represented by the formula of FIG. 1 wherein X is aryl or alkyl; Y is aryl or alkyl; m is a number of from about 2 to about 10; n is a number of from about 10 to about 1,000; k, l, o, p, q, r, s, t, u are are weight fraction numbers totaling one with the sum of k+p+r+t being from about 0.35 to about 0.94; the sum of l+q+s+u being from about 0.05 to about 0.2 and o is from about 0.02 to about 0.5; R is $CH_2CH(R')$, alkyl-CR"C(O)O and alkylene-CR"C(O)O, where R' is an aromatic or substituted aromatic substituent and R" is hydrogen or an alkyl substituent, and pigment particles.

4,954,409

DEVELOPER FOR ELECTROPHOTOGRAPHY

Takayoshi Aoki, and Masayuki Takeda, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 22, 1987, Ser. No. 52,817

Claims priority, application Japan, May 22, 1986, 61-117827; May 22, 1986, 61-117828; May 22, 1986, 61-117829; May 22, 1986, 61-117830

Int. Cl.[5] G03G 9/10

U.S. Cl. 430—108 14 Claims

1. A developer comprising a negatively chargeable toner having a colorant dispersed in a binder resin and a carrier having a core material that is coated with a layer containing a polymer of a fluorinated alkyl acrylate or methacrylate, said binder resin being composed of more than 50 wt % of a styrene-based monomer as a monomer component, and said fluorinated alkyl acrylate or methacrylate constituting less than 50 wt % of the total coating material.

4,954,410

COLOR TONER COMPOSITION

Keisuke Takuma; Tsukasa Ohyama, both of Ohmuta; Isamu Ghoda, Kobe; Tamio Mikoda, Ohmuta; Hitoshi Koshida, Nishinomiya, and Akitoshi Igata, Ohmuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

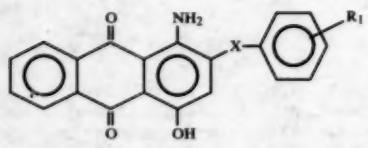
Filed Feb. 24, 1989, Ser. No. 315,051

Claims priority, application Japan, Feb. 26, 1988, 63-42358

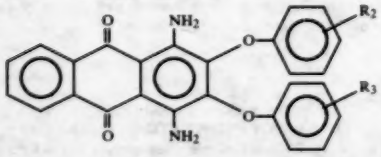
Int. Cl.[5] G03G 9/09

U.S. Cl. 430—109 15 Claims

1. A color toner composition for electrostatic charge development which comprises a binding resin and at least one dyestuff having good light fastness and melt miscibility, which provides stable image density after repeated development by continuous duplication and which is represented by the general formulae (I) or (II)



(I)



(II)

wherein X is an oxygen atom or sulfur atom, and each of R_1, R_2 and R_3 is an alkyl, alkoxy, alkoxyalkoxy or hydroxyl group or a halogen atom.

4,954,411

STATIC LATENT IMAGE DEVELOPMENT TONER

Katsumi Nishibayashi, Hirakata, and Takashi Teshima, Ibaraki, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 3, 1989, Ser. No. 318,251

Claims priority, application Japan, Mar. 11, 1988, 63-59135; Jun. 24, 1988, 63-157465

Int. Cl.[5] G03G 9/08, 9/10

U.S. Cl. 430—111 11 Claims

1. Static latent image developing toner comprising, at least, coloring agent and bonding resin, and having 5 through 20 milliseconds of relaxation time at 100 KHz of frequency.

4,954,412

PROCESSES FOR THE PREPARATION OF ENCAPSULATED TONER COMPOSITIONS

Marcel P. Breton, Mississauga; Yves Deslandes, Gloucester, and Guerino Sacripante, Cambridge, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1988, Ser. No. 265,199

Int. Cl.[5] G03G 9/08

U.S. Cl. 430—137 50 Claims

1. A process for the preparation of encapsulated toner compositions which comprises (1) providing a core comprised of a monomer capable of being polymerized by free radical polymerization, a colorant or pigment, a free radical initiator, a polymer and a first shell monomer dissolved in the core monomer; (2) dispersing said core components in an aqueous phase containing a surfactant, an antifoaming agent, and a phase transfer agent; (3) adding a second shell monomer to the aqueous phase; (4) encapsulating the core components by accomplishing polymerization of the first and second shell monomers; (5) heating the aqueous phase dispersion of (2) and (3) thereby effecting in situ polymerization of the core monomers; and (6) spheroidizing the polymerized shell of (4) by heating at a temperature of from about 20° to about 0° C. below the sticking temperature of the formed toner composition, and wherein the shell is comprised of a thermotropic liquid crystalline polymer.

4,954,413

METHOD OF MAKING PHOTOCONDUCTIVE PARTICLES

Fusaoki Uchikawa, and Kenji Nomura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 168,993, Mar. 16, 1988, abandoned. This application Oct. 18, 1989, Ser. No. 423,694

Claims priority, application Japan, Mar. 17, 1987, 62-62895; Mar. 27, 1987, 62-71733

Int. Cl.[5] G03G 5/09

U.S. Cl. 430—135 7 Claims

1. A method of making a photoconductive powder which comprises the steps of:

mixing in a solution a first principal material containing one or more compounds selected from the group consisting of a metal alkoxide and metal acetylacetonate, which are combined with the respective metal, with a first pigment having a spectral absorption band within the wavelength region of red color so as to provide a first suspension;

mixing in a solution a second principal material containing one or more of said compounds with a second pigment having a spectral absorption band within the wavelength region of blue color so as to provide a second suspension;

mixing in a solution a third principal material containing one or more of said compounds with a third pigment having a spectral absorption band within the wavelength region of green color so as to provide a third suspension;

allowing said first, second and third principal materials to undergo hydrolysis to produce corresponding, first, second and third composite particles composed of particles of oxides of the respective metal and particles of said first, second and third pigments.

4,954,414

PHOTOSENSITIVE COMPOSITION CONTAINING A TRANSITION METAL COORDINATION COMPLEX CATION AND A BORATE ANION AND PHOTOSENSITIVE MATERIALS EMPLOYING THE SAME

Paul C. Adair, Springboro, and Peter Gottschalk, Centerville, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 8, 1988, Ser. No. 268,433
Int. Cl.[5] G03C 1/78, 1/495, 1/68
U.S. Cl. 430—138 37 Claims

1. A photoinitiator including a cationic transition metal coordination complex and a borate anion wherein said borate anion is represented by the following formula:

wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, alkenyl, alkynyl, alicyclic, heterocyclic, and allyl groups, and wherein said photoinitiator is capable of absorbing actinic radiation and producing free radicals.

10. A photoresist material comprising a free radical addition polymerizable or crosslinkable compound and a photoinitiator including a cationic transition metal coordination complex and a borate anion wherein said borate anion is represented by the following formula:

wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, alkenyl, alkynyl, alicyclic, heterocyclic, and allyl groups, and wherein said photoinitiator is capable of absorbing actinic radiation and producing free radicals which can initiate free radical polymerization of said polymerizable or crosslinkable compound.

20. The material according to claim 10 wherein said composition is microencapsulated.

4,954,415

PHOTOINITIATOR COMPOSITIONS CONTAINING O-ACYLTHIOHYDROXAMATE OR AN N-ALKOXYPYRIDINETHIONE AND PHOTOHARDENABLE COMPOSITIONS CONTAINING THE SAME

Paul D. Davis, Centerville, Ohio; Gary B. Schuster, Champaign, Ill.; Jacqueline G. Truini, Dayton, and Al Fentiman, Miamisburg, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 9, 1989, Ser. No. 321,256
Int. Cl.[5] G03F 7/029, 7/031
U.S. Cl. 430—138 13 Claims

1. A photohardenable composition comprising a free radical addition polymerizable or crosslinkable material and a photoinitiator composition, said photoinitiator composition including a compound which absorbs actinic radiation and directly or indirectly generates free radicals, and an O-acylthiohydroxamate or an N-alkoxypyridinethione.

4,954,416

TETHERED SULFONIUM SALT PHOTOINITIATORS FOR FREE RADICAL POLYMERIZATION

Bradford B. Wright, North St. Paul, and Robert J. DeVoe, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 21, 1988, Ser. No. 287,909
Int. Cl.[5] G03C 1/78, 5/00; C08F 2/50
U.S. Cl. 430—281 17 Claims

1. A free radical polymerizable composition comprising an ethylenically unsaturated monomer, at least one of an electron donor and a sensitizer, and a triarylsulfonium salt, wherein at least one of said electron donor and sensitizer is tethered with said sulfonium salt through at least one tetracoordinate carbon atom which is bonded to four separate substituents.

2. The free-radical polymerized composition according to claim 1 wherein said tethered sulfonium salt has a formula selected from formulae (1) and (2) wherein

Formula (1) is:

$$S^+(A^1)_m(A^2—T=Q)_nX^-$$

wherein S^+ is a positively charged sulfur atom,

A^1 is an aryl or substituted aryl group having 6 to 50 carbon atoms,

A^2 is an arylene group having 6 to 50 carbon atoms, which is connected to Q through a tether T,

m = 0, 1, or 2; n = 1, 2, or 3: with the proviso that n + m = 3,

Q represents an electron donor,

T represents the tether which joins the triarylsulfonium slat moiety and Q and contains at least one tetracoordinate carbon atom which is bonded to four separate substituents,

with the proviso that every path from A^2 to Q contains at least one tetracoordinate carbon atoms; and

X is a counterion,

Formula (2) is:

$$(Q\rightarrow T)_jA^2S^+A^3—(T\text{-}Q)_kX^-$$

wherein S^+, A^2, T, Q and X^- are as previously defined,

j = 0, 1, 2, 3, or 4,

k = 0, 1, or 2,

A^3 is a polycyclic group having 1 to 40 carbon atoms comprising at least two distinct fused or single phenyl rings, wherein both phenyl rings are singly and individually bonded to S^+.

16. A method for providing a patterned layered structure comprising the steps:

(a) providing a substrate which is transmissive to actinic radiation having a pattern on a first surface thereof,

(b) coating on at least a portion of the second surface of said substrate a layer of the composition according to claim 1,

(c) subjecting said first surface to actinic radiation for a time sufficient to polymerize said composition,

(d) washing said second surface with a liquid suitable for removing unpolymerized composition in patterned areas to provide a patterned layered structure.

4,954,417

LIGHT-SENSITIVE MICROCAPSULE CONTAINING POLYMERIZABLE COMPOUND AND SILVER HALIDE, AND LIGHT-SENSITIVE MATERIAL EMPLOYING THE SAME

Taku Nakamura; Tsumoru Hirano; Eiji Funatsu, and Shunichi Ishikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 933,510, Nov. 21, 1986, abandoned.
This application Apr. 11, 1989, Ser. No. 336,491
Claims priority, application Japan, Nov. 21, 1985, 60-261888; Jan. 22, 1986, 61-11556
Int. Cl.[5] G03C 1/72
U.S. Cl. 430—138 8 Claims

1. A light-sensitive element comprising a support and a

light-sensitive layer containing silver halide, a polymerizable compound having an ethylenic unsaturated group, a reducing agent having a function of reducing the silver halide or a function of accelerating or restraining polymerization of the polymerizable compound, and a binder,

said silver halide being contained in the light-sensitive layer in such an amount that the total silver content is in the range of from 0.1 mg/m^2 to 10 g/m^2, said polymerizable compound being contained in the light-sensitive layer in an amount of from 5 to 1.2×10^5 times by weight as much as the amount of silver halide, and said reducing agent being contained in the light-sensitive layer in an amount of from 0.1 to 1,500 mole % based on the amount of silver,

wherein the silver halide and polymerizable compound are contained in microcapsules which are dispersed in the light-sensitive layer, said polymerizable compound being arranged as a core material of the microcapsule, and a shell material of the microcapsules containing the silver halide under the condition that the core material contains silver halide in an amount of not more than 30% by weight of the amount of the silver halide in the shell material.

4,954,418

FORMATION METHOD AND PHOTORESIST COMPOSITION FOR PHOSPHOR SCREENS OF COLOR PICTURE TUBES

Norio Koike, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 143,718, Jan. 14, 1988, Pat. No. 4,857,428. This application May 31, 1989, Ser. No. 359,621

Claims priority, application Japan, Jan. 22, 1987, 62-11255

Int. Cl.^{5} G03F *7/008, 7/021;* G03C *1/34*

U.S. Cl. 430—175 **4 Claims**

1. A photoresist composition comprising an admixture of a phosphate of a formalin condensation product of diazodiphenylamine; 2.5-bis(4'-azide-2'-sulphobenzilidene) cyclopentanone and its salts as cross-linking agent; polyvinylalcohol; and polyvinylpyrrolidone, wherein the ratio of the phosphate of the formalin condensation product of diazodiphenylamine to the 2.5-bis(4'-azide-2'-sulphobenzilidene) cyclopentanone and its salts is within the range of about 1:5 to 1:15 by weight and the ratio of the polyvinylalcohol to polyvinylpyrrolidone is within the range of about 1:1 to about 1:8 by weight.

4,954,419

DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT

Yukio Shinagawa; Toru Oikawa; Junichi Yamanouchi, and Kentaro Shiratsuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1989, Ser. No. 333,228

Claims priority, application Japan, Apr. 6, 1988, 63-84666; Jun. 23, 1988, 63-155934

Int. Cl.^{5} G03C *5/54, 1/90*

U.S. Cl. 430—215 **20 Claims**

1. A diffusion transfer photographic film unit comprising a support having thereon outwardly from said support (a) a dye image receiving layer; (b) a first peeling layer containing a copolymer of at least (i)an ethylenically unsaturated monomer containing at least one hydrocarbon group containing from 7 to 18 carbon atoms, and (ii) an ethylenically unsaturated monomer, the homopolymer of which is soluble in water or an aqueous alkaline solution; (c) a second peeling layer containing a cellulose ester; and (d) a light-sensitive silver halide emulsion layer containing a light-sensitive silver halide and a dye image forming substance.

4,954,420

METAL-CONTAINING INDOANILINE COMPOUND AND OPTICAL RECORDING MEDIUM EMPLOYING THE COMPOUND

Shuichi Maeda, Saitama; Toshio Kaneko, Ebina; Yutaka Kurose, Kawasaki; Michiyo Kimura, Shizuoka; Hidemi Yoshida, Atsugi; Kenichi Uchino, Tama, and Shizue Inaba, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

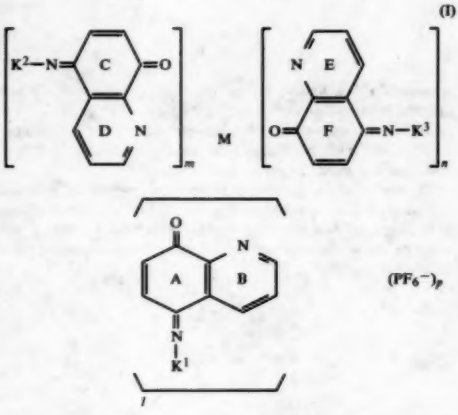
Filed Sep. 30, 1988, Ser. No. 251,364

Claims priority, application Japan, Oct. 2, 1987, 62-249519; Mar. 11, 1988, 63-57846

Int. Cl.^{5} G11B *7/24;* G03C *1/72*

U.S. Cl. 430—270 **8 Claims**

1. A metal-containing indoaniline compound having the formula:



wherein M is a metal atom of Group VIII, Ib, IIb, IIIb, IVa, Va, VIa or VIIa of the Periodic Table or its halide or oxide, rings A, B, C, D, E and F may have substituents, each of K^1, K^2 and K^3 is a residue of a substituted or unsubstituted aromatic amine, each of l, m and n is 0 or 1, provided l+m+n=2 or 3, and p is 2, 3 or 4.

4,954,421

PHOTOFLASHING A LIQUID POLYMER LAYER ON A PHOTOTOOL SURFACE EXPOSED TO AIR

Donald F. Sullivan, Paradise, Pa., assignor to M&T Chemicals Inc., Woodbridge, N.J.

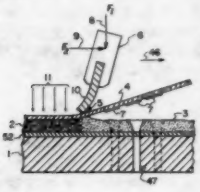
Continuation-in-part of Ser. No. 147,726, May 8, 1980, Pat. No. 4,669,869, and a continuation-in-part of Ser. No. 672,500, Nov. 19, 1984, which is a continuation-in-part of Ser. No. 364,309, Apr. 1, 1982, Pat. No. 4,506,004. This application Apr. 2, 1986, Ser. No. 847,188

Int. Cl.^{5} G03C *1/78*

U.S. Cl. 430—271 **8 Claims**

1. In the method of producing intermediate products used in printing on a substrate surface an insulation pattern formed by a polymer coating, the steps of disposing on an image bearing photographic film transparency a layer of liquid photopolymer with its outer surface exposed to air, exposing the layer with that amount of curing radiation passed through the film to partially expose the layer through its thickness and harden portions in a pattern corresponding to the image on the film

and leaving the layer surface exposed to air in liquid polymer uncured state for contact with said substrate surface as an



intermediate liquid polymer layer between the outercured polymer layer and the substrate.

4,954,422

RECORDING MATERIAL CONTAINING A LAYER OF POLYMER PARTICLES AND A SUPERIMPOSED METALLIC LAYER

Josef Lamprecht, Frankenthal; Gregor Ley, Wattenheim; Arend Werner, and Helmut Barzynski, both of Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 66,999, Jun. 29, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 296,962

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621685

Int. Cl.[5] G03C *1/72, 1/94*

U.S. Cl. 430—275 3 Claims

1. A photosensitive recording material for recording information by means of a local change in the properties of a recording layer under the action of light having a high energy density, which recording material consists essentially of

(a) a base;

(b) a particulate layer consisting of virtually spherical particles on said base, said particles being formed from an organic polymer having a softening point above 50° C. and having a mean particle diameter of not more than 5,000 nm; and

(c) a metallic layer applied to the top of the particulate layer.

3. The photosensitive recording material of claim 1, wherein the virtually spherical particles of the particulate layer consist of an organic polymer having a softening point of from 50 to 150° C. and a mean particle diameter of from 30 to 5000 nm.

4,954,423

PLANAR METAL INTERCONNECTION FOR A VLSI DEVICE

Ronald E. McMann; Evaristo Garcia, Jr., both of Rosenberg; Michael T. Welch, Sugar Land, and Stephen W. Thompson, Richmond, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 11,355, Jan. 19, 1987, abandoned, which is a continuation of Ser. No. 762,885, Aug. 6, 1985, abandoned. This application Mar. 13, 1989, Ser. No. 323,108

Int. Cl.[5] G03C *5/00*

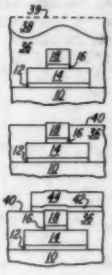
U.S. Cl. 430—316 27 Claims

1. A method of forming a contact or interconnect for a semiconductor integrated circuit device, comprising:

forming first and pillar layers of electrically conducting material on a face of the semiconductor

forming a pillar masking pad on said pillar layer;

photolithographically patterning and etching the pillar and



first layers to the dimension of a first lead confining said pillar masking pad; and

etching the pillar layer to form a pillar.

4,954,424

PATTERN FABRICATION BY RADIATION-INDUCED GRAFT COPOLYMERIZATION

Kozo Mochiji, Hachioji; Hiroaki Oizumi, Kokubunji; Yasunari Soda, Koganei; Taro Ogawa, Kodaira, and Takeshi Kimura, Higashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

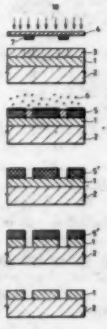
PCT No. PCT/JP88/00691, § 371 Date Dec. 20, 1988, § 102(e) Date Dec. 20, 1988, PCT Pub. No. WO89/01187, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 11, 1988, Ser. No. 295,209

Claims priority, application Japan, Jul. 27, 1987, 62-185480

Int. Cl.[5] G03C *5/16*

U.S. Cl. 430—323 13 Claims

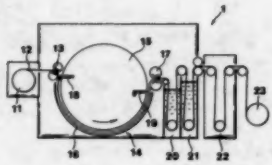


1. A method of pattern fabrication by radiation induced graft copolymerization comprising a coating step of forming, on the surface of a substrate to be fabricated, a resist layer composed of a poly(methacrylate) having a phenyl group and which is capable of graft-copolymerization, an exposure step of irradiating a predetermined region of said resist layer with radiation, a graft copolymerization step of introducing a monomer to graft-copolymerize said resist layer with said monomer, a development step of developing said resist layer to fabricate a predetermined resist pattern, and an etching step of conducting dry etching of the surface of said substrate by making use of said resist pattern as a mask.

4,954,425
METHOD FOR FORMING INTENSIFIED COLOR IMAGE

Haruhiko Iwano, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 15, 1988, Ser. No. 232,253
Claims priority, application Japan, Aug. 13, 1987, 62-200856
Int. Cl.[5] G03C *7/40, 7/26, 7/30*
U.S. Cl. 430—373 **15 Claims**



1. A method for forming an intensified color image comprising subjecting an image-wise exposed silver halide color photographic material substantially free from silver iodide as the photosensitive silver halide and containing 80 mole % or more of silver chloride to color-development processing using a monobath development-intensifying solution containing

(1) hydrogen peroxide or a compound that releases hydrogen peroxide,

(2) a color-developing agent,

(3) bromide ions in an amount of 2×10^{-4} mol/l or less, and

(4) iodide ions in an amount of 3×10^{-3} mol/l or less,

in an amount of 5 l to 0.05 l of monobath development-intensifying solution per m^2 of the photographic material.

4,954,426
METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Takatoshi Ishikawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 28, 1988, Ser. No. 187,600
Claims priority, application Japan, Apr. 30, 1987, 62-106600
Int. Cl.[5] G03C *7/16, 7/42*
U.S. Cl. 430—386 **15 Claims**

1. A method for processing a silver halide color photographic light-sensitive material having a coated silver halide in an amount of not more than 0.8 g/m^2 as an amount of elemental silver, which comprises color developing the light-sensitive material and then subjecting the developed material to a bleach-fixing treatment of a single bleach-fixing bath containing a bleach-fixing solution, the amount of bleach-fixing solution replenished being 0.2 to 15 times the volume of the color developer carried over, to the bleach-fixing bath by the processed light-sensitive material per unit area thereof, and the amount of the replenisher for the bleach-fixing bath also being 20 to 250 ml per 1 m^2 of the processed light-sensitive material, and further wherein not less than 80 mole % of the total nonmetallic cations present in the replenisher for the bleach-fixing solution comprise ammonium ions.

4,954,427
PROCESS FOR THE FORMATION OF DIRECT POSITIVE IMAGES

Noriyaki Inoue; Tetsuro Kojima; Tatsuo Heki, and Shigeo Hirano, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1987, Ser. No. 60,790
Claims priority, application Japan, Jun. 12, 1986, 61-136949
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[5] G03C *5/22, 5/24*
U.S. Cl. 430—409 **32 Claims**

1. A process for the formation of direct positive color images which comprises (1) imagewise exposing to light a light-sensitive material comprising a photographic emulsion layer containing unfogged internal latent image type silver halide particles on at least one support, and (2) developing said light-sensitive material with a processing solution with a pH of 9.5 to 11.5 containing as a main component a p-phenylenediamine and in the presence of a nucleating agent and at least one nucleation accelerator of general formula (I):

$$A-Y)_nR]_m \qquad (I)$$

wherein A represents a group which is adsorbed by a silver halide; Y represents a divalent linkage group consisting of a hydrogen atom, a carbon atom, a nitrogen atom, an oxygen atom, and a sulfur atom; R represents an organic group containing at least one of a thioether group, an amino group, an ammonium group, an ether group, and a heterocyclic group; n represents an integer of 0 or 1; and m represents an integer of 1 or 2, to form direct positive color images.

4,954,428
COATING FOR INCREASING SENSITIVITY OF A RADIATION IMAGEABLE POLYACETYLENIC FILM

David F. Lewis, Monroe, Conn., and Robert D. Schenfele, Caldwell, N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Division of Ser. No. 258,522, Oct. 17, 1988. This application Sep. 1, 1989, Ser. No. 401,717
Int. Cl.[5] G03C *1/72, 1/78*
U.S. Cl. 430—495 **17 Claims**

1. The process which comprises overcoating as a discrete overcoat layer the surface of an imageable polyacetylenic layer disposed on an irradiation imageable film with an effective sensitizing amount of the composition comprising between about 0.001% and about 1.0% by weight of an N-alkyl lactam dispersing aid and a metal nitrate, acetate or persulfate salt of a metal having an atomic number of at least 50 or a mixture of said metal salts dispersed in between about 4% and about 50% by weight of an aqueous solution of a binder compatible with the binder of imageable polyacetylene crystals; said composition having a weight ratio of metal salt to binder between about 0.4:1 and about 2.5:1.

4,954,429
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL FOR LASER RECORDING

Yukihide Urata, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1988, Ser. No. 263,226
Claims priority, application Japan, Oct. 29, 1987, 62-274233
Int. Cl.[5] G03C *1/10, 7/26*
U.S. Cl. 430—503 **8 Claims**

1. A color photographic material comprising a support having thereon at least one red-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer and at least one blue-sensitive silver halide emulsion layer, wherein each of the silver halide emulsion layers is sensitized by adding at least one sensitizing dye at 50° C. to 80° C., and with respect to helium-cadmium laser light having a wavelength of 441.6 nm,

(1) the ratio of the sensitivity of the green-sensitive emulsion layer to that of the blue-sensitive emulsion layer is at most 0.1 and

(2) the ratio of the sensitivity of the red-sensitive emulsion layer to that of the blue-sensitive emulsion layer is at most 0.10;

with respect to argon laser light having a wavelength of 514.5 nm,

(1) the ratio of the sensitivity of the blue-sensitive emulsion layer to that of the green-sensitive emulsion layer is at most 0.1 and

(2) the ratio of the sensitivity of the red-sensitive emulsion

layer to that of the green-sensitive emulsion layer is at most 0.10; and

with respect to helium-neon laser light having a wavelength of 632.8 nm,

(1) the ratio of the sensitivity of the blue-sensitive emulsion layer to that of the red-sensitive emulsion layer is at most 0.1 and

(2) the ratio of the sensitivity of the green-sensitive emulsion layer to that of the red-sensitive emulsion layer is at most 0.10.

4,954,430

SILVER HALIDE PHOTOGRAPHIC ELEMENT WITH POLYESTER BASE

Kunio Ishigaki, and Takashi Naoi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 157,835, Feb. 19, 1988, abandoned. This application Jan. 19, 1990, Ser. No. 467,284

Claims priority, application Japan, Feb. 19, 1987, 62-36244; Apr. 16, 1987, 62-94133; Jun. 4, 1987, 62-140634; Jul. 15, 1987, 62-176626

Int. Cl.[5] G03C *1/82*

U.S. Cl. 430—534 **6 Claims**

1. A silver halide element comprising, in sequence:

(i) a biaxially oriented polyester support having a thickness of 40 to 200 μm.

(ii) a polymer layer on both surfaces of said polyester support, and

(iii) at least one hydrophilic colloid layer containing from 0.01 to 1.0 parts by weight of a polymer latex per 1.0 part by weight of a binder in said hydrophilic colloid layer, on at least one side of said polyester support,

wherein at least one of said hydrophilic colloid layers is a silver halide emulsion layer, and wherein said polymer layer consists essentially of a copolymer containing from 50–99.5% by weight vinylidene chloride and 50 0.5% by weight of at least one comonomer, and wherein each polymer layer has a thickness of at least 0.3 μm.

4,954,431

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toyoki Nishijima, and Masaki Tanji, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

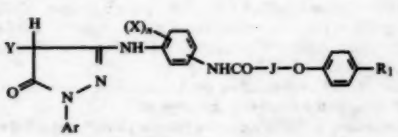
Filed Jun. 23, 1989, Ser. No. 370,814

Claims priority, application Japan, Jul. 6, 1988, 63-166895

Int. Cl.[5] G03C *7/38*

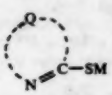
U.S. Cl. 430—546 **15 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer and a non-light-sensitive layer, wherein said silver halide emulsion layer contains at least one of the magenta couplers represented by the following Formula I, and at least one of said silver halide emulsion layer and said non-light-sensitive layer contains at least one of the compounds represented by the following Formula S:



(I)

wherein Ar is an aryl group; Y is a hydrogen atom or a group capable of being split off upon reaction with the oxidation product of a color developing agent, X is a halogen atom, an alkoxy group or an alkyl group; R_1 is a straight or branched chain alkyl group having 1 to 20 carbon atoms; J is a straight or branched chain alkylene group; and n is an integer of 0 to 4, provided that the groups represented by X may be the same with or different from each other when n is 2 or more,



(S)

wherein Q is a group of atoms necessary to complete a five-or six-member heterocyclic ring which is allowed to be condensed with a benzene ring or a naphthalene ring; M is a hydrogen atom, an alkali metal atom or an ammonium group.

10. The materila of claim 1, wherein a high-boiling organic solvent having a dielectric constant of not more than 6.5 is contained in said silver halide emulsion layer.

4,954,432

PHOTOGRAPHIC MATERIAL WITH SOLVENT HAVING DIELECTRIC CONSTANT OF 6 OR LESS AND YELLOW COUPLER

Toyoki Nishijima, Odawara, Japan, assignor to Konica Corporation, Tokyo, Japan

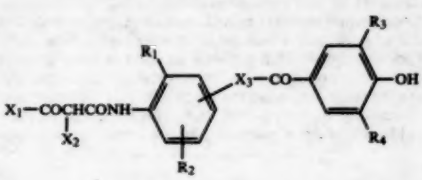
Filed Dec. 29, 1988, Ser. No. 291,750

Claims priority, application Japan, Jan. 7, 1988, 63-2076

Int. Cl.[5] G03C *7/34, 7/36*

U.S. Cl. 430—546 **18 Claims**

1. A silver halide light-sensitive photographic material comprising a support and provided thereon at least one silver halide emulsion layer containing a yellow dye-forming coupler having a formula [A] below and a high boiling organic solvent having a dielectric constant of not more than 6.0;



[A]

wherein R_1 represents a halogen atom or a substituted or unsubstituted alkoxy group having 1 to 4 carbon atoms; R_2 represents a hydrogen atom, a halogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted alkoxy group; R_3 and R_4 independently represent a substituted or unsubstituted alkyl group which is capable of making said coupler non-diffusible in the photographic material; X_1 represents a substituted or unsubstituted tertiary butyl group or a substituted or unsubstituted p-alkoxy phenyl group; X_2 represents a hydrogen atom or a group which is capable of being split off during color development; and X_3 represents a linking group.

4,954,433

METHOD FOR THE IMMUNOLOCALIZATION OF ANTIGENS WITH THE USE OF ANTIBODIES DIRECTED AGAINST EPITOPES OF NON-GLUCIDIC NATURE

Paolo Ruggiero, Siena, and Roberto Petracca, Monteroni D'Arbia, both of Italy, assignors to Sclavo S.p.A., Siena, Italy

Filed Sep. 2, 1988, Ser. No. 239,642

Claims priority, application Italy, Sep. 4, 1987, 21792 A/87

Int. Cl.[5] G01N *33/535*

U.S. Cl. 435—7 **8 Claims**

1. Method for the immunolocalization of antigens by means of the use of antibodies directed against epitopes of non-glucidic nature, which comprises:

(a) submitting the sample to a treatment for modifying or masking any possibly present glucidic residues,

(b) treating the sample with specific antibodies for the antigen to be determined, belonging to the class of the IgM's under conditions, and for a time sufficient for the immunologic reaction to take place,
(c) treating the sample with concanavalin A under conditions, and for a time sufficient for the binding between the molecules of IgM bound to the antigen, and concanavalin A, to take place,
(d) treating the sample with the enzymatic marker peroxidase, which contains a glucidic residue recognizable by concanavalin A, and
(e) incubating the enzymatic marker with a substrate specific for peroxidase wherein a color development is an indication of the presence of said antigens containing epitopes of non-glucidic nature.

4,954,434

ISOFERRITIN AS A MARKER FOR PATHOLOGICAL PREGNANCY

Chaya Morox, 40 Yehuda Hanasi St., Tel Aviv, Israel (69393)

Continuation-in-part of Ser. No. 179,183, Apr. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 164,947, Mar. 7, 1988, which is a continuation-in-part of Ser. No. 148,133, Jan. 22, 1988, Pat. No. 4,882,270, which is a continuation of Ser. No. 568,275, Jan. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 373,715, Apr. 30, 1982, abandoned. This application Jun. 23, 1988, Ser. No. 210,601
Claims priority, application Israel, May 15, 1981, 62879
Int. Cl.[5] G01N *33/53, 33/543, 33/577*
U.S. Cl. 435—7 **18 Claims**

1. A method of diagnosing a pathological pregnancy which comprises contacting serum or amniotic fluid of a pregnant female with a first antibody capable of reacting with placental isoferritin (PLF), and a second antibody having specificity for PLF, said second antibody being linked to a reporter molecule capable of producing a detectable signal; allowing time sufficient for an antibody-PLF-antibody complex to form; observing the presence or absence of the detectable signal; quantifying any signal to determine the amount of PLF in the serum; and comparing the amount of PLF with standards of PLF normal for the stage of pregnancy of the female being tested.

4,954,435

INDIRECT COLORIMETRIC DETECTION OF AN ANALYTE IN A SAMPLE USING RATIO OF LIGHT SIGNALS

Gary H. Krauth, Jordan, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 12, 1987, Ser. No. 2,334
Int. Cl.[5] G01N *33/53, 33/543;* **C12Q** *1/28;* **G01J** *3/42*
U.S. Cl. 435—7 **4 Claims**

1. A method employing an enzyme immunoassay for measuring the concentration of an analyte in a sample by indirect colorimetric detection comprising:
(a) combining a peroxidase-labeled antibody conjugate, a sample to be tested for an analyte, and an antibody bound to the interior surfaces of a transparent plastic tube so that the analyte binds to said bound antibody and said conjugate to form an immunologic complex in solid phase;
(b) admixing into said tube a liquid solution containing a tetramethylbenzidine and hydrogen peroxide to cause a reaction with said immunologic complex and to activate the tetramethylbenzidine for a colorimetric response;
(c) adding to said admixture a particle-containing solution which terminates said reaction and causes a stable particulate suspension to result;
(d) directing incident light at a plurality of wavelengths through said tube into said suspension, a first wavelength of said incident light being substantially at 450nm at which activated tetramethylbenzidine attenuates by absorption the amount of light scattered from said incident light as a function of the increasing concentration of the analyte present, a second wavelength being spectrally removed from said first wavelength and at which substantially no attenuation of light scatter occurs as the concentration of the analyte increases;
(e) detecting light scattered by the suspension at said first and at said second wavelengths and forming a ratio of said two respective wavelengths; and
(f) comparing the magnitude of said formed ratio with the magnitude of a ratio associated with light scatter detection when steps (a) to (e) are performed with samples containing known concentrations of said analyte, whereby the concentration of the analyte in the sample is measured.

4,954,436

DIHYDROPYRIDINE-SENSITIVE CALCIUM CHANNEL AS A TUMOR ASSOCIATED MARKER

Stanley C. Froehner, Hanover, and Mary E. Morton, Etna, both of N.H., assignors to Trustees of Dartmouth College, Hanover, N.H.

Filed Aug. 6, 1987, Ser. No. 83,239
Int. Cl.[5] G01N *33/53, 33/566;* **A61K** *39/00;* **C07K** *15/14*
U.S. Cl. 435—7 **14 Claims**

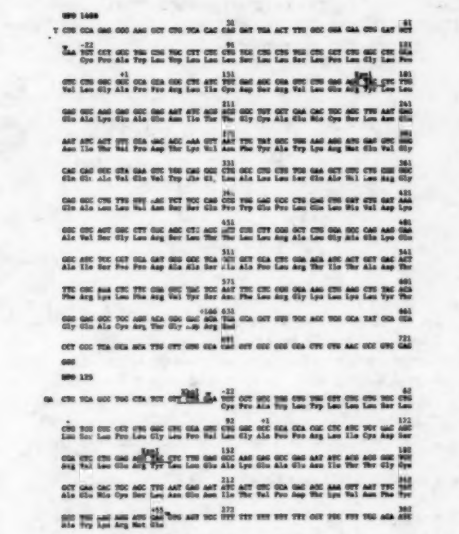
1. A monoclonal antibody which is specific for the 200kDa polypeptide of the dihydropyridine-sensitive calcium channel, the molecular mass of which remains unafffected by disulfide bond reduction.

11. A method of diagnosing small carcinoma of the lung or a neuroblastoma, comprising the steps of:
a. contacting a tissue specimen from a patient suspected of being afflicted with small cell carcinoma of the lung or a neuroblastoma with an antibody which specifically reacts with the dihydropyridine-sensitive calcium channel; and
b. determining whether the antibody binds to cells of the tissue specimen by immunohistochemical techniques, the binding of the antibody being an indication of the presence of small cell carcinoma of the lung or a neuroblastoma.

4,954,437
CELL ENCODING RECOMBINANT HUMAN ERYTHROPOIETIN

Anton K. Beck, Wellesley; Raymond M. Withy; James R. Zabrecky, both of Framingham, and Nicholas C. Masiello, Milford, all of Mass., assignors to Integrated Genetics, Inc., Framingham, Mass.

Filed Sep. 15, 1986, Ser. No. 907,369
Int. Cl.[5] C12P 21/02; C12N 15/00, 5/00; C07K 13/00
U.S. Cl. 435—69.4 10 Claims



1. A C127 cell transformed with a recombinant DNA vector comprising a DNA sequence encoding human erythropoietin, said transformed cell being capable of producing N-linked and O-linked glycosylated human erythropoietin.

4,954,438
PROCESS FOR PREPARING ANTIBIOTICS D788-7

Akihiro Yoshimoto, Fujisawa; Osamu Jodo, Yokohama; Yoshio Watanabe; Rokuro Okamoto, both of Fujisawa, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

Filed Aug. 21, 1989, Ser. No. 397,061
Claims priority, application Japan, Aug. 25, 1988, 63-211623
Int. Cl.[5] C12P 19/56; C07H 15/24
U.S. Cl. 435—78 5 Claims

1. A process for preparing an antibiotic D788-7 wherein carborubicin in acetone solution is exposed to light.

4,954,439
MULTIRIBBON MICROBIAL CELLULOSE

R. Malcolm Brown, Jr., Austin, Tex., and Foag C. Lin, Yun Lin Hsieu, Taiwan, assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Mar. 9, 1987, Ser. No. 23,336
Int. Cl.[5] C12P 19/04; C08B 15/00; C12N 1/00
U.S. Cl. 435—101 17 Claims

1. Cellulose produced by a biologically pure culture of a cellulose-producing microorganism, capable, during growth in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances, or during a resting phase in an aqueous nutrient medium containing an assimilable source of carbon and inorganic substances, of reversal of direction of cellulose ribbon extrusion such that said cellulose-producing microorganism shuttles, at least periodically, in a first direction and then in a second direction along a length of an earlier deposited cellulose ribbon to add another cellulose ribbon thereto and produce a cellulose ribbon-bundle comprising at least two antiparallel cellulose ribbons.

15. Cellulose characterized as having a ribbon-bundle structure comprising at least two anti-parallel cellulose ribbons having beta 1,4-linkages in a first direction alternating with beta 1,4-linkages in an opposite direction, said bundle structure further characterized as forming a plurality of hydrogen bonds conferring enhanced tension and shearing strength.

4,954,440
PRODUCTION OF POLYSACCHARIDES FROM FILAMENTOUS FUNGI

Sarjit S. Johal, Sagamore Hills, and Howard A. Cash, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 207,695, Jun. 16, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 436,108
Int. Cl.[5] C12P 19/04; C12N 11/00, 1/14; C07H 1/00
U.S. Cl. 435—101 21 Claims

1. A process to produce a scleroglucan or schizophyllan product from a filamentous fungi comprising inoculating an immobilized cell bioreactor with a filamentous fungi, permitting the filamentous fungi to passively attach to and anchor onto a surface of a support matterial immersed in the bioreactor which material is porous wherein the pores are greater than 0.1 mm, non-particulate and fixed, incubating the fungi for at least 2 hours in the bioreactor while the aqueous nutrient medium is circulated throughout the bioreactor; and feeding grown the media and withdrawing the synch product containing medium from the bioreactor.

4,954,441
PROCESS FOR PRODUCING L-LYSINE

Ryoichi Katsumata; Toru Mizukami, both of Machida, and Tetsuo Oka, Yokohama, all of Japan, assignors to Kyowa Hakko Kogyo Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 836,989, Mar. 6, 1986, abandoned. This application May 25, 1989, Ser. No. 356,614
Claims priority, application Japan, Mar. 12, 1985, 60-47515
Int. Cl.[5] C12N 1/21, 9/88, 15/03, 15/31
U.S. Cl. 435—115 6 Claims

1. A process for producing L-lysing which comprises culturing in a medium a microorganism belonging to the genus Corynebacterium or Brevibacterium carrying a recombinant DNA comprising a gene coding for dihydrodipicolinic acid synthase (dapA) isolated from a microorganism belonging to the genus Corynebacterium or Brevibacterium, accumulating L-lysine in the culture broth, and recovering L-lysine therefrom.

4,954,442
OPINE ENHANCEMENT OF VIR GENE INDUCTION

Stanton B. Gelvin, West Lafayette, Ind., and K. Veluthambi, Madurai, India, assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 31, 1988, Ser. No. 239,183
Int. Cl.[5] C12N 15/63, 15/84; A01H 1/06, 4/00
U.S. Cl. 435—172.3 13 Claims

1. In a method for genetically transforming plant cells by infecting said cells with a genetically engineered Agrobacterium species characterized by an acetosyringone mediated induction of Ti-plasmid vir gene transcription, the improvement which comprises the steps of inducing vir gene transcription of Ti-plasmids in the genetically engineered Agrobacterium species with acetosyringone in the presence of an effective induction enhancing amount of an opine from the Octa-

pine family or Nopaline family to promote production of T-strand DNA in said induced species, and thereafter infecting the plant cells with an inoculum comprising the vir gene induced Agrobacterium species.

4,954,443

METHOD OF IMMOBILIZING BIOCHEMICALLY ACTIVE SUBSTANCE WITH XANTHAN GUM

Osamu Yamada, and Tadasu Fujita, both of Yokohama, Japan, assignors to The Nisshin Oil Mills, LTD., Tokyo, Japan

Continuation of Ser. No. 810,600, Dec. 19, 1985, abandoned. This application Nov. 18, 1988, Ser. No. 274,604

Claims priority, application Japan, Dec. 27, 1984, 59-273786; Feb. 12, 1985, 60-24988

Int. Cl.[5] C12N *11/10, 11/02, 11/04*

U.S. Cl. 435—178 11 Claims

1. A method of immobilizing a biochemically active substance, consisting essentially of: mixing a first aqueous solution containing at least one biochemically active substance and an immobilizing agent selected from the group consisting of xanthan gum and derivatives thereof with a second aqueous solution containing metal ions having a valence of 3 or more, selected from the group consisting of iron, tin, manganese and titanium ions in an amount sufficient to precipitate the xanthan gum or derivatives thereof and obtain a precipitate containing the biochemically active substance immobilized therein.

4,954,444

ENZYME IMMOBILIZATION AND BIOAFFINITY SEPARATIONS WITH PERFLUOROCARBON POLYMER-BASED SUPPORTS

John William d. Eveleigh, Hockessin, and Robert K. Kobos, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 20,808, Mar. 2, 1987, Pat. No. 4,885,250. This application Dec. 17, 1987, Ser. No. 134,028

The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.

Int. Cl.[5] C12N *11/06, 11/08;* G01N *33/549;* C07K *17/08*

U.S. Cl. 435—181 25 Claims

1. A solid support containing an attached ligand or binder for the ligand consisting essentially of:

(A) a chemically inert, water immiscible solid perfluorocarbon polymer carrier having low nonspecific binding to a ligand or binder for the ligand;

(B) a highly fluorinated isocyanate-modified ligand or binder for the ligand securely but reversibly attached to the surface of said carrier through said highly fluorinated isocyanate; and

(C) a nonionic fluorosurfactant coating on said carrier.

4,954,445

NAD(P)H OXIDASE

Yoshio Yoshihama, Otsu; Asuka Kagaya, Nishinomiya; Susumu Matsui, Otsu, and Akira Obayashi, Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Aug. 11, 1987, Ser. No. 83,921

Claims priority, application Japan, Aug. 12, 1986, 61-188824; Nov. 28, 1986, 61-283240

Int. Cl.[5] C12N *9/06, 9/02*

U.S. Cl. 435—191 1 Claim

1. Novel NAD(P)H oxidase having the following enzymological properties:

(1) Action

It oxidizes NADH or NADPH in the presence of oxygen to form NAD or NADP and hydrogen peroxide.

$$NAD(P)H+H^{+}+O_2 \rightarrow NAD(P)^{+}+H_2O_2$$

(2) Substrate specificity

It acts upon NADH and NADPH.

(3) Optimum pH

Its optimum pH lies in the range of about 9 to 10.

4,954,446

AROMATIC STEROID 5-α-REDUCTASE INHIBITORS

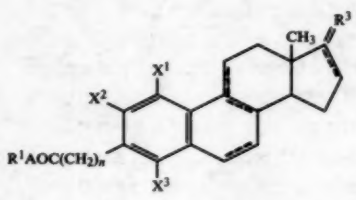
Dennis A. Holt, Downington; Mark A. Levy, St. Davids, and Brian W. Metcalf, Radnor, all of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 198,534, May 25, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 380,226

Int. Cl.[5] A61K *31/56;* C07J *41/00*

U.S. Cl. 435—184 14 Claims

1. A compound represented by the formula:



(I)

in which:

the B, C, and D rings have optional double bonds where indicated by the broken lines, provided that the C ring does not have a double bond when the B ring has a C_8–C_9 double bond and the D ring does not have a C_{16}–C_{17} double bond when R^3 represents two substituents or a divalent substituent;

X^1, X^2, and X^3 are any accessible combination of H, Cl, F, Br, I, CF , or C_{1-6}alkyl OH, C_{1-6}alkoxy, CN, NO_2, $N(R^1)_2$, CHO, or CO_2R^1;

A is O or S;

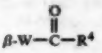
n is 0 or 1;

R^1 each independently is H or C_{1-8}alkyl; and

R^3 is

(1) α-hydrogen, α-hydroxyl, or α-acetoxy and/or

(a)



where W is a bond or C_{1-12}alkyl, and R^4 is

(i) hydrogen,

(ii) hydroxyl,

(iii) C_{1-8}alkyl,

(iv) hydroxy C_{1-8}alkyl,

(v) C_{1-8}alkoxy,

(vi) NR^5R^6, where R^5 and R^6 are each independently selected from hydrogen, C_{1-8}alkyl, C_{3-6}cycloalkyl, phenyl; or R^5 and R^6 taken together with the nitrogen to which they are attached represent a 5–6 membered saturated ring comprising up to one other heteroatom selected from oxygen and nitrogen, or

(vii) OR^7, where R^7 is alkali metal, C_{1-18}alkyl, or benzyl, or

(b) β-Alk-OR^8, where Alk is C_{1-12}alkyl, and R^8 is

(i) phenylC_{1-6}alkylcarbonyl,

(ii) C_{5-10}cycloalkylcarbonyl,

(iii) benzoyl,

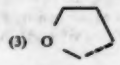
(iv) C_{1-8}alkoxycarbonyl,

(v) amino, or C_{1-8}alkyl substituted amino, carbonyl, or

(vi) C_{1-8}alkyl,

(2) =CH—W—CO—R^4 or =CH—W—OR^8, where W is a bond or C_{1-12}alkyl and R^4 and R^8 have the same meaning as above and R^8 also is C_{1-20}alkylcarbonyl;

(3)



where the dashed bond replaces the 17-α-hydrogen,

(4) α-hydrogen and β-NHCOR^9 where R^9 is C_{1-12}alkyl or β-NR^{5}R^6 where R^5 and R^6 have the same meaning as above,

(5) α-hydrogen and β-cyano,

(6) α-hydrogen and β-tetrazolyl, or

(7) keto;

or a pharmaceutically acceptable salt thereof; except the compound in which:

R^1 is CH_3, n is 0, A is O, and R^3 is keto.

4,954,447

FERAXANASE, A HIGHLY SPECIFIC ENZYME FOR HYDROLYSIS OF COMPLEX POLYSACCHARIDES

Donald J. Nevins, Davis, Calif., and Kazuhiko Nishitani, Kagoshima, Japan, assignors to The Regents of the University of California, Oakland, Calif.

Filed Jul. 22, 1988, Ser. No. 223,125

Int. Cl.^{5} C12N *15/56, 9/24*

U.S. Cl. 435—200 **12 Claims**

1. A composition comprising a substantially pure enzyme which degrades arabinoxylan and has a molecular weight of about 45,000.

4,954,448

MODULATION OF ADENYLATE CYCLASE RESPONSE

Karl E. Wiegand, Baton Rouge, La., and Robert K. Rude, Los Angeles, Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed Dec. 27, 1988, Ser. No. 290,307

Int. Cl.^{5} C12N *9/88*

U.S. Cl. 435—232 **7 Claims**

1. A process for modulating the enzymatic activity of an adenylate cyclase, said process comprising contacting said cyclase with a modulating amount of silicic acid said modulating amount being no more than about the level of saturation of silicic acid.

4,954,449

HUMAN MONOCLONAL ANTIBODY REACTIVE WITH POLYRIBOSYLRIBITOL PHOSPHATE

Kenneth W. Hunter, Kensington, and Gerald W. Fischer, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 411,115, Aug. 24, 1982, Pat. No. 4,744,982. This application Feb. 12, 1988, Ser. No. 155,437

Int. Cl.^{5} C12N *5/00*; C07K *15/00, 15/28*

U.S. Cl. 435—240.27 **2 Claims**

1. A self-reproducing hybridoma containing genes that produce a human monoclonal antibody reactive with antigenic polyribosybribitol phosphate capsular polysaccharide.

4,954,450

METHOD FOR CONTROLLING THE CONCURRENT GROWTH OF TWO OR MORE LACTIC ACID PRODUCING BACTERIA

Carl F. Brothersen, Millville, Utah, and Willard R. W. Knoespel, Green Bay, Wis., assignors to Miles Laboratories, Inc., Madison, Wis.

Filed Aug. 17, 1987, Ser. No. 86,155

Int. Cl.^{5} C12N *1/20*; C12P *39/00, 7/56*; A23C *19/00*

U.S. Cl. 435—252.4 **1 Claim**

1. A method of growing a mixture of lactic acid producing *Lactobacillus bulgaricus* or *L. helviticus* and *Streptococcus thermophilus* in a suitable nutrient medium which comprises:

(a) allowing the mixture of bacteria to grow at a temperature of from 44° to 46° C. until the lactic acid produced thereby lowers the pH of the medium to a level of from 4.7 to 5.0;

(b) maintaining the pH within the range specified in step (a) ±0.2 pH units while maintaining the temperature of the medium at a level of from about 44° to 46° C. for a time sufficient for the Lactobacillus sp. to grow to the desired concentration;

(c) adding neutralizer to the medium to raise the pH to a level of from 5.4 to 6.0; and

(d) maintaining the pH within the range specified in step (c) ±0.2 pH units while maintaining the temperature of the medium at a level of from about 36° to 40° C. until the *S. thermophilus* grow to the desired concentration; and

(e) cooling the medium to a level where further growth of the bacteria is inhibited.

4,954,451

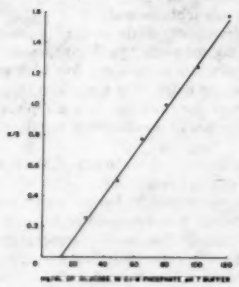
AGENT FOR DIMINISHING ASCORBATE INTERFERENCE IN REAGENT SYSTEMS AND METHOD RELATING THERETO

James P. Albarella, and Mietak T. Yip, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Jun. 26, 1989, Ser. No. 371,253

Int. Cl.^{5} G01N *1/00, 33/00, 33/72*

U.S. Cl. 436—175 **2 Claims**



1. A method for substantially eliminating ascorbate interference in a reagent system, said method comprising:

combining a reagent system containing a redox indicator with a water insoluble cerium IV compound.

4,954,452

NON-METAL COLLOIDAL PARTICLE IMMUNOASSAY

David A. Yost, Round Lake Park, Ill.; John C. Russell, Greenfield, Wis., and Heechung Yang, Green Oaks, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jul. 9, 1987, Ser. No. 72,084

Int. Cl.^{5} G01N *33/551, 33/566, 33/543, 33/536*

U.S. Cl. 436—524 **28 Claims**

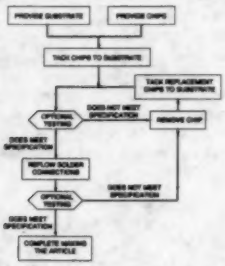
1. A method for determining the presence or amount of an analyte in a sample comprising the steps of: contacting said sample with a non-metal labelled constituent comprising colloidal non-metal inorganic particles selected from the group consisting of sulfur, selenium, and tellurium having conjugated thereto a binding component capable of specifically recognizing said analyte; and then determining the presence or amount of analyte/colloidal non-metal particle complexes as a measure of the amount of analyte in the sample.

4,954,453

METHOD OF PRODUCING AN ARTICLE COMPRISING A MULTICHIP ASSEMBLY

John H. Venutolo, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 24, 1989, Ser. No. 316,050
Int. Cl.[5] H05K 3/00; H01L 21/66
U.S. Cl. 437—8 5 Claims



1. Method of producing an article comprising a multichip assembly that comprises a substrate with a multiplicity of electronic subassemblies thereon, a given subassembly attached to the substrate by means of a multiplicity of localized solder regions, the subassemblies to be referred to as "chips" and the localized solder regions to be referred to as "solder bumps"; the method comprising

(a) producing multichip assemblies;

(b) testing at least some of the multichip assemblies;

(c) if the testing indicates that a given assembly does not meet predetermined criteria due to a fault associated with a given chip or chips then the given chip or chips are removed from the substrate, and a replacement chip or chips are attached to the substrate; and the method further comprises

(d) completing producing the article; CHARACTERIZED IN THAT step (c) comprises

(e) heating at least the solder bumps between the given chip and the substrate to a temperature Tr, such that $T_r < T_m$, where T_m is the absolute solidus temperature of the solder, the heating carried out such that a temperature gradient exists across the solder bumps; and

(f) applying to the given chip a combination of a torque and a lifting force, the combination being sufficient to cause separation of the given chip from the substrate.

4,954,454

METHOD FOR FABRICATING A POLYCRYSTALLINE SILICON RESISTOR

Kazuhiro Kobushi, Osaka; Shuichi Kameyama, Itami, and Tadao Komeda, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 131,739, Dec. 11, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 374,608
Claims priority, application Japan, Dec. 16, 1986, 61-299436; Dec. 16, 1986, 61-299437
Int. Cl.[5] H01L 21/265
U.S. Cl. 437—21 5 Claims

1. A method for fabricating a polycrystalline silicon resistor comprising the steps of:

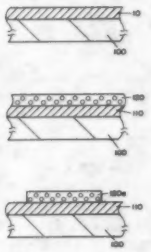
forming a dielectric film on a substrate;

forming a polycrystalline silicon film on said dielectric film;

ion-implanting first atoms which do not determine conductivity type into said polycrystalline silicon film without making a surface of said polycrystalline silicon film, which does not contact said dielectric film, amorphous;

applying a first heat treatment to said polycrystalline silicon film which contains said first atoms which do not determine conductivity type, to substantially increase the uniformity of distribution of said first atoms in said polycrystalline silicon film and to substantially increase the crystal grain size and uniformity of said polycrystalline silicon film;

applying second atoms which determine conductivity type into said polycrystalline silicon film which said heat treatment is applied to; and



applying a second heat treatment to said polycrystalline silicon film which contains said second atoms to substantially increase the uniformity of distribution of said second atoms in said polycrystalline silicon film and

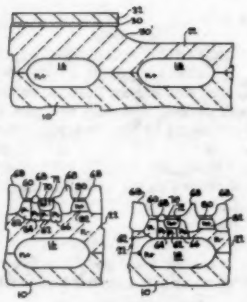
wherein said polycrystalline silicon film is patterned and used as a resistor on said dielectric film.

4,954,455

SEMICONDUCTOR MEMORY DEVICE HAVING PROTECTION AGAINST ALPHA STRIKE INDUCED ERRORS

Drew Wanderman, Palo Alto, and Matthew Weinberg, Mountain View, both of Calif., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Continuation of Ser. No. 211,179, Jun. 24, 1988, abandoned, which is a continuation of Ser. No. 683,288, Dec. 18, 1984, abandoned. This application Oct. 18, 1988, Ser. No. 259,472
Int. Cl.[5] H01L 21/331
U.S. Cl. 437—31 20 Claims



1. A method of constructing an improved bipolar integrated circuit device having bipolar memory transistors and bipolar logic transistors comprising the steps of:

forming first and second buried collector layer regions of a first conductivity type on a silicon substrate;

forming an epitaxial silicon layer of said first conductivity type over said silicon substrate and first and second buried collector layer regions thereon;

selectively masking a portion of said epitaxial silicon layer including portions over said first buried collector layer

region to expose substantially only portions of said epitaxial silicon over said second buried collector layer region;
removing at least some of said exposed epitaxial silicon layer;
simultaneously forming base regions of a second conductivity type in said epitaxial layer over said first buried collector layer region and in said epitaxial layer over said second buried collector layer region; and
simultaneously forming emitter regions of said first conductivity type in said base regions over said first buried collector layer region and said second buried collector layer region;
whereby a memory transistor with said second buried collector layer region has increased base-collector capacitance and greater immunity from alpha particle strikes compared to a'logic transistor with said first buried collector layer region.

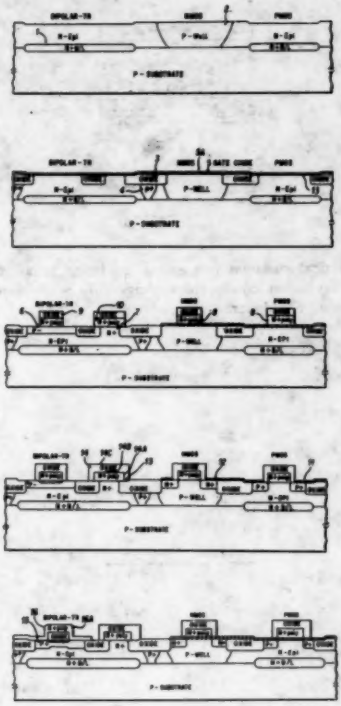
4,954,456

FABRICATION METHOD FOR HIGH SPEED AND HIGH PACKING DENSITY SEMICONDUCTOR DEVICE (BICMOS)

Kwang S. Kim; Sang Hun Chai; Young S. Koo; Yeo H. Kim, and Jin H. Lee, all of Chung Nam, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Rep. of Korea

Filed Jul. 25, 1988, Ser. No. 224,020
Claims priority, application Rep. of Korea, Jul. 25, 1987, 87-8119
Int. Cl.[5] H01L *21/225*
U.S. Cl. 437—31 **3 Claims**

1. In a fabrication method for high speed and high packing density semiconductor devices, the steps of:
forming an N^+-type buried layer upon a P-type substrate;
growing an N-epitaxial layer upon it;
depositing an oxide film and carrying out a masking process for defining a P-well;
implanting and diffusing an impurity down to the N-epitaxial layer in order to form a P-well;
removing the oxide film on the P-well and N-epitaxial layer;
growing a buffer oxide film, and depositing a nitride film on the oxide film upon the P-well and N-epitaxial layer;
growing an oxide film in order to complete a device isolation region, after the formation of a P^+ junction isolation region;
growing a gate oxide film of CMOS after removal of the buffer oxide film;
ion-implanting an impurity in order to form a base and a collector of bipolar transistors;
after removal of photoresist film, depositing polysilicon, and implanting an impurity in order to make the polysilicon an N^+ type;
depositing an oxide film upon the N^+ polysilicon;
forming gates of CMOS elements and emitters and collectors of bipolar transistors;
implanting an impurity in order to form source/drains of PMOS devices;
implanting an impurity in order to form source/drains of NMOS devices;
depositing an oxide film, and carrying out an etching so that an oxide film remains on a side wall of the N^+ type polysilicon;
depositing polysilicon upon oxide film and doping an impurity by a thermal diffusion method or an ion-implantation method to make the polysilicon a P^+ type;
carrying out a diffusion in order to form a P^+ extrinsic base area; and



removing photoresist film of the masking area so that the polysilicon remains at the base region of the bipolar transistor.

4,954,457

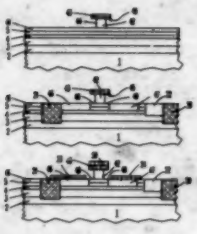
METHOD OF MAKING HETEROJUNCTION BIPOLAR TRANSISTORS

Chakrapani G. Jambotkar, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 264,428, Oct. 31, 1988. This application Jan. 22, 1990, Ser. No. 467,850
Int. Cl.[5] H01L *21/331*
U.S. Cl. 437—31 **23 Claims**

1. In a process of forming a bipolar transistor in a compound semiconductor body wherein a larger area base electrode layer forms on one side thereof a p-n junction with a buried electrode layer and on the other side of said base layer a smaller area electrode forms a p-n junction therewith, the improvement comprising the step of
providing an overhang capability on the portion of said smaller area electrode separated from said p-n junction, said overhang imparting the combined properties of
masking of said base layer in at least one of a conductivity conversion and a metal deposition operation orthogonally directed with respect to said base layer,

ledge type direction change in shape in lift-off separation of deposited materials, and



vertical distance processing guidance in an erosion operation conducted orthogonally with respect to said base layer.

4,954,458

METHOD OF FORMING A THREE DIMENSIONAL INTEGRATED CIRCUIT STRUCTURE

Lee R. Reid, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 384,454, Jun. 3, 1982, Pat. No. 4,754,316. This application Apr. 4, 1988, Ser. No. 176,976

Int. Cl.[5] **H01L** *21/70, 27/00*

U.S. Cl. 437—51 **7 Claims**

2. A method for forming a semiconductor circuit apparatus comprising:

(a) forming at least one hole in a first semiconductor substrate by applying an orientation dependent etch;

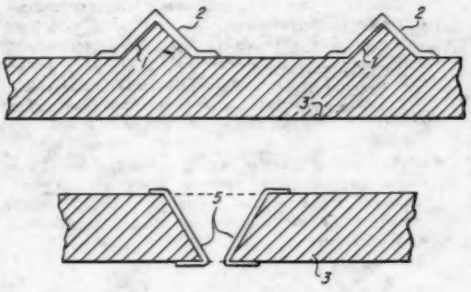
(b) applying an electrically conductive coating from one side of said first semiconductor substrate through said hole to the opposite side of said first semiconductor substrate;

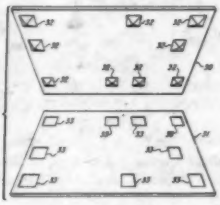
(c) forming at least one elevated portion upon said first semiconductor substrate by applying an orientation dependent etch;

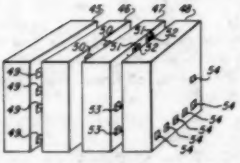
(d) applying an electrically conductive coating to said elevated portion;

(e) forming electrically conductive bonding pads on a second semiconductor substrate that are selectively positioned relative to the elevated portions formed on the first semiconductor substrate; and

(f) forming contacts between said first substrate and said second substrate by forming an electrically conductive bond between said elevated portions on said first substrate







with said electrically conductive pads on said second substrate.

4,954,459

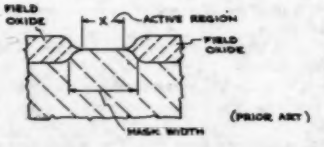
METHOD OF PLANARIZATION OF TOPOLOGIES IN INTEGRATED CIRCUIT STRUCTURES

Steven C. Avanzino, Cupertino, and Jacob D. Haskell, Palo Alto, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 193,478, May 12, 1988. This application Jul. 3, 1989, Ser. No. 376,176

Int. Cl.[5] **H01L** *21/465*

U.S. Cl. 437—228 **21 Claims**



17. A method of making a highly planarized integrated circuit structure having field oxide regions formed therein

between active regions of a substrate, and at the same level as the active regions, which comprises:

(a) patterning a silicon substrate with a first photoresist mask having openings therein conforming to desired formation of field oxide regions in said substrate between said active regions;

(b) etching said silicon substrate through said photoresist mask to form openings in said substrate having a depth of from about 0.45 microns to about 0.55 microns;

(c) removing said first photoresist mask;

(d) depositing from about 7000 to about 9000 Angstroms of a conformal oxide layer over said substrate;

(e) forming a second photoresist mask over said conformal oxide layer, said mask having openings therein in registry with the portions of said substrate between said openings etched in said substrate;

(f) isotropically etching said conformal oxide layer through said second mask to a level substantially equal to the level of the masked portions of said conformal oxide layer;

(g) removing said second photoresist mask;

(h) polishing said conformal oxide layer to remove raised portions of said conformal oxide layer; and

(i) anisotropically etching said conformal oxide layer to expose said active regions of said substrate to form a highly planarized structure having field oxide regions formed therein between said active regions in said substrate with the upper surface of said field oxide regions substantially level with the surface of said active regions.

4,954,460

WATER-PERMEABLE CERAMIC MATERIAL

Fumikazu Tanemura; Toru Honda; Shigetoshi Ohta; Yoshiharu Kajita, all of Aichi, and Tatsushi Kachi, Tokyo, all of Japan, assignors to Mino Yogyo Co., Ltd., Mizunami, Japan

Continuation-in-part of Ser. No. 274,712, Nov. 21, 1988, abandoned, which is a continuation of Ser. No. 177,872, Apr. 1, 1988, abandoned, which is a continuation of Ser. No. 75,189, Jul. 1, 1987, abandoned, which is a continuation of Ser. No. 824,292, Jan. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 704,384, Feb. 22, 1985, abandoned. This application Aug. 29, 1989, Ser. No. 399,924

Claims priority, application Japan, Feb. 24, 1984, 59-33449

Int. Cl.[5] C04B *38/00, 33/24*

U.S. Cl. 501—80 **3 Claims**

1. A water-permeable ceramic material comprising porcelain particles having a particle size in the range of 7–60 mesh, a bulk density of 2.3 kg/l or more and a porosity of up to about 16.7%, and a matrix having a melting temperature lower than a melting point of said porcelain particles, which is formed from one or more primary binders selected from the group consisting of organic binders, clay and water glass and one or more glassy secondary binders,

said ceramic material having an apparent porosity of from about 10 to less than 53%,

said ceramic material having continuous pores connecting front to back of the ceramic material each of which has an average diameter of at least 0.1 mm therein,

said ceramic material having a water permeability of at least 50 ml/min cm^2,

said ceramic material being formed by mixing said particles with said primary and secondary binders, compressing the resultant mixture under a pressure of from about 30–200 kg/cm^2, and sintering the compressed mixture.

4,954,461

HIGH PURITY AND HIGH STRENGTH INORGANIC SILICON NITRIDE CONTINUOUS FIBER

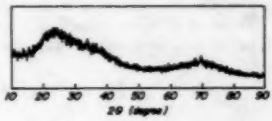
Kiyohito Okamura, Mito; Mitsuhiko Sato; Yoshio Hasegawa, both of Higashi-Ibaraki; Tadao Seguchi, Fujioka, and Shunichi Kawanishi, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,184

Claims priority, application Japan, Mar. 20, 1987, 62-67391

Int. Cl.[5] C04B *35/58;* **C01B** *21/063, 33/06*

U.S. Cl. 501—95 **1 Claim**



1. An inorganic silicon nitride continuous fiber consisting essentially of an amorphous material composed of Si and N, crystals of δ-Si_3N_4 or crystals of α-Si_3N_4 uniformly distributed in the amorphous material composed of Si and N, wherein said fiber has a tensile strength of 140 to 400 kg/mm^2, an elastic modulus of 12 to 40 ton/mm^2, a density of 2.1 to 3.1 g/cm^3, a specific resistivity of at last 10^7 Ω.cm, and a dielectric constant of 6.0 to 9.5.

4,954,462

MICROCRYSTALLINE ALUMINA-BASED CERAMIC ARTICLES

Thomas E. Wood, and David M. Wilson, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 58,564, Jun. 5, 1987, abandoned. This application Mar. 1, 1989, Ser. No. 318,450

Int. Cl.[5] C04B *35/10;* **B01J** *13/00*

U.S. Cl. 501—95 **35 Claims**

1. A solid, fired refractory article comprising in the range of 0.1 to 7.0 percent by weight iron equivalence and at least 60% alumina by weight in which at least 99 percent of the alumina is in the alpha phase having a uniform grain structure comprising alpha alumina crystallites wherein the average crystallite diameter is less than 0.5 micrometer, at least 95 percent of the alpha alumina crystallites are less than 0.5 micrometer in diameter and no grains are larger than 0.5 micrometer in diameter, the density of the article is greater than 90% of theoretical density, and the surface roughness height of the article is less than 100 nm.

26. A process for forming an alumina-based ceramic article, the process comprising the steps:

a. preparing a solution of a basic aluminum salt or other hydrolyzable alumina precursor and iron-containing nucleating agents, said nucleating agents being hydrous iron polymers which are formed by hydrolysis of an iron salt solution;

b. forming the solution into a desired form or coating, and at least one of gelling and drying the solution to obtain a solid form; and

c. calcining the solid;

the ceramic article comprising in the range of 0.1 to 7.0 percent by weight iron equivalence and at least 60% alumina by weight in which at least 99 percent of the alumina is in the alpha phase having a uniform grain structure comprising alpha alumina crystallites wherein the average crystallite diameter is less than 0.5 micrometer and at least 95 percent of the alpha alumina crystallites are less than 0.5 micrometer in diameter and all are less than 0.7 micrometer in diameter, and the density of the article is greater than 90% of theoretical density.

4,954,463

MAGNESIUM ALUMINATE SPINEL REFRACTORY

Richard J. Knauss, Swissvale, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 12, 1988, Ser. No. 283,230

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] **C04B** *35/04*

U.S. Cl. 501—120 **13 Claims**

1. A refractory mix for forming an in situ magnesium aluminate spinel refractory shape consisting essentially of about 65 to 99 wt.% magnesite having an MgO content of at least about 92 wt.% and, correspondingly, about 35 to 1 wt.% calcined bauxite having an alumina content of at least about 83 wt.% and a silica content of no more than about 7 wt.%; the total silica content of the mix being no more than about 4 wt.%.

4,954,464

LOW TEMPERATURE SINTERED DIELECTRIC CERAMIC COMPOSITION

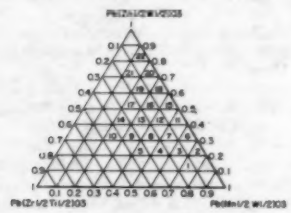
Won T. Choi, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 30, 1989, Ser. No. 443,211

Claims priority, application Rep. of Korea, Nov. 30, 1988, 88-15835

Int. Cl.[5] **C04B** *35/49*

U.S. Cl. 501—134 **1 Claim**



1. A dielectric ceramic composition for sintering at a low temperature for use in capacitors consisting essentially of:

a dielectric ceramic composition represented by the formula $(Pb(Zr_{\frac{1}{2}}Ti_{\frac{1}{2}})O_3)x$, $(Pb(Mn_{\frac{1}{3}}W_{\frac{2}{3}})O_3)y$ and $(Pb(Zn_{\frac{1}{3}}W_{\frac{2}{3}})O_3)z$, wherein each x, y, and z is greater than O, x plus y plus z equal 1, and x is 0.1 to 0.5 mole fraction, y is 0.1 to 0.7 mole fraction, and z is 0.1 to 0.8 mole fraction.

4,954,465

APPARATUS FOR REMOVING STINK

Masaei Kawashima, Fujiokamachi; Reishi Naka; Teruo Tsunoda, both of Ohiramachi; Nobuyoshi Suenaga, Oyama; Syozo Ogawa, Ohiramachi; Masaaki Kashiwabuchi, Tochigi; Miyakichi Kameda, Sano, and Koosuke Tanaka, Ohiramachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

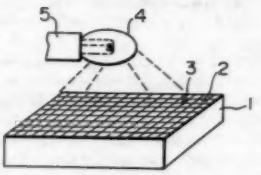
Filed Jan. 11, 1989, Ser. No. 295,754

Claims priority, application Japan, Jan. 22, 1988, 63-10601; Jan. 22, 1988, 63-10602

Int. Cl.[5] **B01J** *37/34*

U.S. Cl. 502—5 **7 Claims**

1. A stink removing apparatus using absorbent, comprising a member in which photocatalyst is applied on a surface of said absorbent for absorbing stink ingredient or as mixed and kneaded with said absorbent, said photocatalyst decomposing



the stink ingredient absorbed on said absorbent when excited by light and a light source for exciting said photocatalyst.

4,954,466

RECOVERY OF COBALT CATALYST VALUES

Robert B. Weisenfeld, Manchester, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 30, 1989, Ser. No. 443,281

Int. Cl.[5] **B11J** *31/40;* **B01J** *38/68;* **C10G** *51/04, 51/06*

U.S. Cl. 502—24 **12 Claims**

1. A process for recovering cobalt values from a mixture of N-acetyliminodiacetic acid and a cobalt catalyst used to produce the N-acetyliminodiacetic acid which comprises:

(a) dissolving said mixture in a hydrochloric acid solution or hydrobromic acid solution;

(b) extracting the resulting acid solution with an extractant which consists essentially of a liquid hydrocarbon solvent containing an effective cobalt extracting amount of a trialkylamine;

(c) separating the extractant phase containing the cobalt values from the aqueous phase;

(d) stripping the extractant phase with water;

(e) precipitating the cobalt values from the stripping water by adding an alkali metal hydroxide or alkali metal carbonate; and

(f) recovering the precipitated cobalt values.

4,954,467

PASSIVATION OF METAL CONTAMINATED CRACKING CATALYSTS USING AQUEOUS SUSPENSIONS OF ANTIMONY OXIDE

Marvin M. Johnson, Bartlesville, Okla., and Donald C. Tabler, Fort Collins, Colo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 907,767, Sep. 15, 1987. This application Oct. 28, 1988, Ser. No. 264,295

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] **B01J** *29/38, 21/20, 13/00;* **C90G** *11/05*

U.S. Cl. 502—26 **14 Claims**

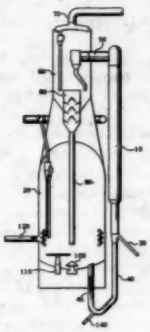
1. A method for restoring the activity of a hydrocarbon cracking catalyst in which the cracking activity of said cracking catalyst is at least partially decreased by contaminating metals deposited thereon comprising the step of injecting a metals passivating agent suspension comprising antimony onto said cracking catalyst while said cracking catalyst is in the catalyst regeneration cycle, further characterized by the fact that said metals passivating agent suspension comprises

(a) water;

(b) antimony oxide; and,

(c) a vinyl copolymer, wherein said vinyl copolymer is the ammonium salt of hydrolyzed copolymers of methylvinyl ether and maleic anhydride, wherein the antimony oxide is present in the form of a first source of particulate antimony oxide comprising large diameter antimony oxide particles, wherein at least 70 percent of said large diameter antimony oxide particles are in the range of about 1 mi-

cron to about 5 microns, and a second source of particulate antimony oxide of smaller diameter antimony oxide particles than in said first source, wherein at least 90 per-



cent of said small diameter antimony oxide particles are in the range of from about 0.01 microns to about 0.99 microns.

4,954,468

SYNTHETIC ALLKALI METAL ALUMINO-SILICATES, METHODS AND USES, COMPOSITIONS AND THEIR METHODS OF PREPARATION

Satish K. Wason, Macon, Ga., assignor to J. M. Huber Corporation, Rumson, N.J.

Division of Ser. No. 116,805, Nov. 3, 1987, Pat. No. 4,812,299, which is a continuation-in-part of Ser. No. 875,120, Jun. 17, 1986, abandoned. This application Jan. 19, 1989, Ser. No. 299,279

Int. Cl.[5] B01J *20/16, 21/16, 29/06*

U.S. Cl. 502—63 **9 Claims**

1. A dry-up liquid or carrier composition which contains as the effective ingredient, an alkali metal alumino-silicate having a composition in terms of mole ratio of oxides as follows:

$$xM_2O:Al_2O_3:ySiO_2:zH_2O$$

wherein x is the number of moles of alkali metal oxide and is an integer of 0.01 to 2.0, M is an alkali metal, y is the number of moles of SiO_2 associated with the compositions and is an integer of 2.0 to 20.0, and z is the number of moles of bound water and is an integer of 1.0 to 5.0, wherein primary particles of said alkali metal alumino-silicate comprise a core of clay platelets having an integral adjacent area of essentially amorphous alkali metal silicate base-kaolin clay reaction product.

4,954,469

GRANULATED ACTIVATED CARBON FOR WATER TREATMENT

Ken K. Robinson, 5 N 553 Jens-Jensen La., St. Charles, Ill. 60175

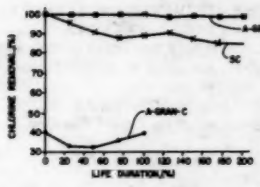
Continuation-in-part of Ser. No. 226,789, Aug. 1, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 368,077

Int. Cl.[5] B01J *20/12, 20/20, 20/26;* **B29C** *67/02*

U.S. Cl. 502—80 **9 Claims**

1. A process of preparing a spherically-shaped, agglomerated granuled carbon composition from an activated carbon powder, the major portion of which is a carbon powder having a surface area of from about 2800 to about 3800 m^2/gm and exhibiting a trimodal pore volume distribution of peak volumes in the micropore size of <10 A°, the meso-pore size of from about 40 to about 200 A°, and a macro-pore side of >1000 A°, which process comprises the steps of:

(a) mixing with agitation to form spherically-shaped granules an aqueous slurry of the carbon powder with from about 40 to about 60%, based on the weight of the carbon, of a hydrocarbon bridging liquid, and from about 5 to about 25%, based on the weight of the carbon, of a binder selected from the group consisting of clays and organic polymer adhesives;



(b) separating and drying the granules; and

(c) activating the granules by steam treatment at a temperature of about from 105° to about 120° C. to produce granules having particle diameters of from about 0.17 to about 0.71 mm.

4,954,470

CHLORINATED ALCOHOL-CONTAINING CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

Thomas E. Nowlin, Somerset, and Kenneth G. Schurzky, Bridgewater, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 143,989, Jan. 14, 1988, Pat. No. 4,849,389. This application Dec. 21, 1988, Ser. No. 287,214

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[5] C08F *4/64, 4/68*

U.S. Cl. 502—107 **50 Claims**

1. A process for preparing a supported alpha-olefin polymerization catalyst composition which comprises the steps of:

(i) contacting a slurry of a solid, porous carrier and a non-polar solvent with at least one organomagnesium composition having the formula

$$R_mMgR_n' \quad (I)$$

where R and R' are the same or different C_4–C_{12} alkyl groups, m and n are each 0, 1 or 2, provided that m+n is equal to the valence of Mg;

(ii) contacting the slurry of step (i) with at least one chlorinated alcohol of the formula

$$R''—OH \quad (II)$$

where R'' is a C_2–C_{10} chlorinated alkyl group;

(iii) contacting the slurry of step (ii) with at least one transition metal compound soluble in the non-polar solvent; and

(iv) combining the product of step (iii) with a catalyst activator.

4,954,471

HOMOGENEOUS OR SUPPORTED VANADIUM BASED CATALYST FOR OLEFIN POLYMERIZATION

Steven A. Best, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 28, 1988, Ser. No. 276,978

Int. Cl.[5] C08F *4/68*

U.S. Cl. 502—110 **21 Claims**

1. A method for preparing a hydrocarbon soluble vanadium based catalyst component for the production of polyolefins, comprising the steps of:

(i) forming a hydrocarbon insoluble reaction product from a

silicon alkoxide, a hydrocarbon soluble vanadium compound and a trialkylaluminum; and

(ii) reacting said hydrocarbon insoluble reaction product with an alkylaluminum dihalide to form a hydrocarbon soluble vanadium containing composition which is active for the polymerization of olefins to polyolefins.

4,954,472

TEMPERATURE ACTIVATED CATALYSTS FOR LIQUID POLYMER CURES

Keith W. Scott, Shrewsbury, and Bryan G. Willoughby, Telford, both of England, assignors to Rapra Technology Limited, Shrewsbury, England

Filed Dec. 9, 1988, Ser. No. 282,038

Claims priority, application United Kingdom, Dec. 12, 1987, 8729069

Int. Cl.[5] B01J *31/12*

U.S. Cl. 502—152 **19 Claims**

1. A temperature-activated catalyst for curing a polyurethane or liquid polyether, comprising a polymeric support which is glassy at ambient temperature and insoluble in the phase of the polymer being cured, and which has bound thereto a compound for catalyzing the curing of said polymer, the activity of said catalyst being a function of the glass transition temperature of the support.

4,954,473

METHOD OF PREPARING A CATALYST FOR THE HYDROCONVERSION OF ASPHALTENE-CONTAINING HYDROCARBONACEOUS CHARGE STOCKS

John G. Gatsis, Des Plaines, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jul. 18, 1988, Ser. No. 220,707

Int. Cl.[5] B01J *31/00*

U.S. Cl. 502—171 **16 Claims**

1. A method for the preparation of a catalyst which method comprises the following steps:

(a) adding to an asphaltene-containing hydrocarbonaceous oil charge stock an oil-insoluble metal compound and water;

(b) converting said oil-insoluble metal compound within said charge stock by heating said oil to a temperature from about 120° F. (43° C.) to about 500° F. (260° C.) to produce an organometallic compound within said charge stock; and

(c) converting said organometallic compound within said charge stock under hydroconversion conditions including a temperature from about 650° F. (343° C.) to about 1000° F. (538° C.), a hydrogen partial pressure from about 500 psig (3448 kPa gauge) to about 5000 psig (36480 kPa gauge) and a space velocity from about 0.1 to about 10 volumes of oil feed per hour per volume of reactor to produce said catalyst.

4,954,474

PROCESS FOR PREPARING CATALYSTS BY ALLOYING METALS ON SUPPORTS

Kazunori Tsurumi, Tokyo; Toshihide Nakamura, Funabashi, and Akira Sato, Misato, all of Japan, assignors to Tanaka Kikinzoku Kogyo K.K., Japan

Filed Feb. 17, 1989, Ser. No. 312,671

Claims priority, application Japan, Feb. 18, 1988, 63-36250

Int. Cl.[5] B01J *21/18, 23/64, 23/89*; H01M *4/88*

U.S. Cl. 502—185 **6 Claims**

1. A process for preparing catalysts by alloying metals on inorganic supports comprising:

applying a solution of an organic acid amine salt of a second metal onto the inorganic supports already supported with a first metal;

reducing the salt to the corresponding metal; and

alloying the metals by heating.

4,954,475

ZINC-CONTAINING ORTHO-ALKYLATION CATALYST PRECURSOR AND CATALYST, AND PROCESS OF USE IN ALKYLATION OF PHENOLS

James G. Bennett, Jr., Glenmont, and Gregory R. Chambers, Delmar, both of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Continuation of Ser. No. 640,080, Aug. 13, 1984, abandoned. This application Nov. 30, 1987, Ser. No. 126,555

Int. Cl.[5] B01J *23/02*

U.S. Cl. 502—343 **16 Claims**

1. An active ortho-alkylation catalyst composition which, in an alkylation reaction conducted at a temperature between 300° C. and 440° C., yields phenols selected from the group consisting of 2-alkylphenols and 2,6-dialkylphenols in excess of phenols alkylated in the para position, comprising a mixture of

(a) a material selected from the group consisting of magnesium oxide and compounds that are thermally decomposable to magnesium oxide; and

(b) up to about 20% by weight of a substantially water insoluble zinc compound, said composition having been calcined to an active ortho-alkylation catalyst by heating at a temperature from about 350° to 440° C.

4,954,476

METHOD OF MAKING CATALYSTS FROM TITANIUM OXIDE

Erich Hums, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,899

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701984

Int. Cl.[5] B01J *21/06*

U.S. Cl. 502—350 **17 Claims**

1. In a method for making a catalyst containing titanium oxide as a chief ingredient and derived from a titania source starting material selected from the group of titania acids consisting of meta-titanic acid, ortho-titanic acid and mixtures thereof, the improvement which comprises the steps of adding to dissolved starting material an acidic, water-soluble flocculent selected from the group consisting of soluble vanadates, silicic acid derivatives, sulfuric acid, soluble phosphates, phosphoric acid, soluble molybdates, soluble tungstates, and acidic particulate carbon suspensions and then treating the mixture by a hydrothermal process consisting of the steps of elevating the temperature of the mixture of starting material and flocculent while maintaining said mixture at the autogenously-generated pressure.

4,954,477

HEAT-SENSITIVE RECORDING MATERIALS

Shigekazu Shuku, Nara; Shunichiro Mukoyoshi, Hyogo; Eiji Yuasa, Hyogo, and Tsunefumi Yamori, Hyogo, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 342,049

Claims priority, application Japan, Apr. 28, 1988, 63-106912

Int. Cl.[5] B41M *5/18*

U.S. Cl. 503—226 **7 Claims**

1. A heat-sensitive recording material comprising:

A. a support,

B. a heat-sensitive recording layer containing a color former and a color developer, color being formed by contact of the color developer with the color former formed on the support,

C. an interlayer containing a water-soluble resin or a water-dispersible resin as the main component formed on the heat-sensitive recording layer, and

D. an overcoat layer on the interlayer, said overcoat layer being formed by:

(1) forming a layer containing a macromonomer having a polymerizable functional group at one terminal of the

molecular chain, the main component of the segment being organopolysiloxane, said polymerizable functional group being at least one member selected from the group consisting of an acryloyl group, a methacryloyl group, an allyl group, a dicarboxyl group, and a dihydroxyl group, and an electron beam-curable resin on the interlayer, and

(2) curing the overcoat layer by the irradiation of electron beams.

4,954,478

THERMAL DYE TRANSFER SHEET

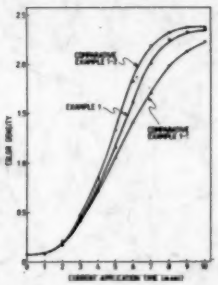
Nobuyoshi Taguchi; Akihiro Imai, both of Ikoma; Yukichi Murata, Sagamihara, and Takao Hirota, Machida, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd. and Mitsubishi Kasei Corporation, both of, Japan

Filed Nov. 23, 1988, Ser. No. 276,420

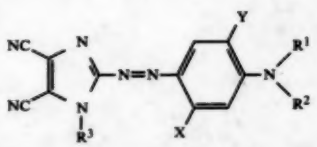
Claims priority, application Japan, Nov. 25, 1987, 62-296453

Int. Cl.[5] B41M *5/035, 5/26*

U.S. Cl. 503—227 **19 Claims**

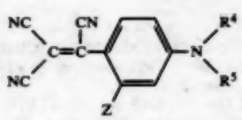


1. A thermal magenta-dye transfer sheet that comprises a base film having thereon a dye layer comprising a magenta dye dispersed in a binder, said dye being a mixture of dyes represented by the following general formulas (I) and (II):



(I)

(where X is a hydrogen atom, a lower alkyl group, a lower alkoxy group, a formylamino group, a lower alkylcarbonylamino group, a lower alkylsulfonylamino group or a lower alkoxy-carbonylamino group; Y is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom; and R^1, R^2 and R^3 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a cycloalkyl group, an allyl group or a substituted or unsubstituted aryl group)



(II)

(where Z is a hydrogen atom or a lower alkyl group; and R^4 and R^5 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a cycloalkyl group, an allyl group, or a substituted or unsubstituted aryl group, and R^4 may also form a heterocyclic 6-membered ring by being bonded to a carbon atom adjacent to the carbon binding to the nitrogen atom which is bonded to the benzene ring).

4,954,479

COMPOSITE SUPERCONDUCTING STRAND HAVING A HIGH CRITICAL TEMPERATURE, AND METHOD OF MANUFACTURE

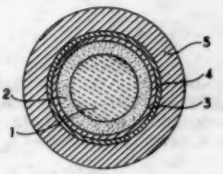
Patrick Dubots, Neauphle le Chateau, and Denis Legat, Lisses, both of France, assignors to Societe Anonyme dite:Alsthom, Paris, France

Filed Dec. 2, 1988, Ser. No. 279,166

Claims priority, application France, Dec. 2, 1987, 87 16720

Int. Cl.[5] H01B *13/00*

U.S. Cl. 505—1 **2 Claims**



1. A composite superconducting strand having a high critical temperature comprising a filament of sintered powder of superconducting oxide and an outer covering of copper, and additionally comprising around said filament, and in order:

an inner covering or an metallic oxide which is inert relative to said superconducting oxide and which is selected in such a manner as to ensure sufficient oxygen partial pressure around said filament for the oxygen of the superconducting oxide to be maintained therein;

a first layer of cladding made of a material which is poorly permeable to oxygen and which is selected from the group consisting of aluminum, an alloy of copper and aluminum, and stainless steel; and

a second layer of cladding made of a material acting as a diffusion barrier to the copper of said outer covering and is selected from the group consisting of niobium, tantalum and vanadium.

4,954,480

MULTI-LAYER SUPERCONDUCTING CIRCUIT SUBSTRATE AND PROCESS FOR MANUFACTURING SAME

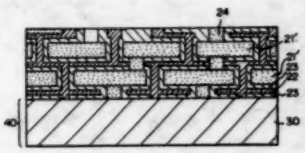
Yoshihiko Imanaka; Takato Machi, both of Atsugi; Kazunori Yamanaka; Hiromitsu Yokoyama, both of Sagamihara; Noboo Kamehara, Isehara, and Koichi Niwa, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 27, 1988, Ser. No. 197,583

Claims priority, application Japan, Apr. 27, 1987, 62-105624

Int. Cl.[5] B32B *3/00*

U.S. Cl. 505—1 **4 Claims**



1. A multi-layer substrate, comprising:

a plurality of insulating layers laminated into a multi-layer structure, the insulating layers being fired and having holes penetrated therethrough;

interconnection layers of an oxide superconductive ceramic material located between the insulating layers, said superconductive, interconnection layers being fired,

wherein said plurality of insulating layers is made of a glass-ceramic material fired at a temperature lower than a temperature for firing the superconductive interconnection layers;

superconductive ceramic material filling said holes of said insulating layers and electrically connecting said interconnection layers; and

a metal layer encapsulating the interconnection layers of the superconductive ceramic material, the metal of the metal layer being selected from the group of gold, silver, platinum and an alloy thereof.

4,954,481

SUPERCONDUCTOR-POLYMER COMPOSITES

Aimé S. DeReggi, Boyds; Chwan-Kang Chiang, Rockville, and George T. Davis, Gaithersburg, all of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 29, 1988, Ser. No. 292,601

Int. Cl.[5] B32B *3/02*

U.S. Cl. 505—1 **8 Claims**

1. Composite material, comprising a matrix formed of a thermoplastic polymer and a superconductor powder dispersed in the matrix, the superconductor powder having a composition $RBa_2Cu_3O_{7-x}$ wherein R is a rare earth metal and x is less than or equal to 1, said thermoplastic polymer comprising a vinylidene fluoride homopolymer or copolymer.

4,954,482

NEW GLYCOPEPTIDE ANTIBIOTIC

Hiroshi Maeda; Junsuke Tone, both of Chita, Japan; John C. Ruddock, Ash, and Kelvin S. Holdom, Minster, both of England, assignors to Pfizer Inc., New York, N.Y.

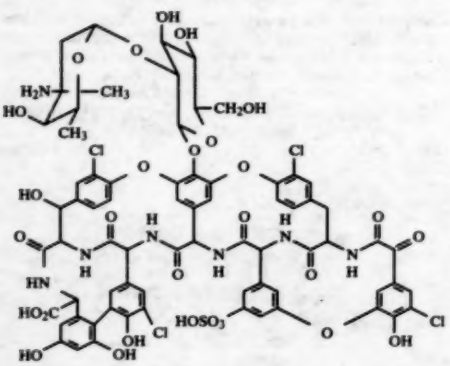
Continuation of Ser. No. 101,626, Sep. 28, 1987, abandoned. This application Jul. 20, 1989, Ser. No. 384,052

Claims priority, application United Kingdom, Oct. 16, 1986, 8624806

Int. Cl.[5] A61K *37/02*; C07K *9/00, 7/50*

U.S. Cl. 514—8 **4 Claims**

1. The antibiotic UK-68,597 having the formula



or a pharmaceutically acceptable cationic salt thereof.

4,954,483

CARBOXYLIC ACID ESTER DERIVATIVES OR DEGLUCOTEICOPLANIN

Adriano Malabarba, Milan; Paolo Strazzolini, Fiume Veneto; Aldo Trani, Milan; Ambrogio Magni, Osnago, and Bruno Cavalleri, Milan, all of Italy, assignors to Gruppo Lepetit, S.p.A., Italy

PCT No. PCT/EP85/00262, § 371 Date Feb. 6, 1986, § 102(e) Date Feb. 6, 1986, PCT Pub. No. WO86/00075, PCT Pub. Date Jan. 3, 1986

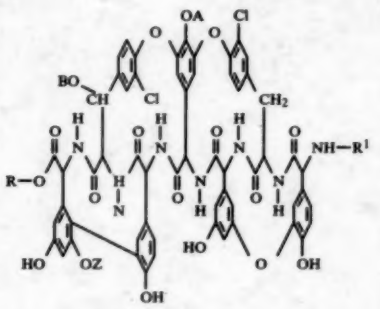
Continuation-in-part of Ser. No. 131,245, Dec. 7, 1987, abandoned, which is a continuation of Ser. No. 839,320, Feb. 6, 1986, abandoned. This PCT application Jun. 2, 1985, Ser. No. 243,168

Claims priority, application United Kingdom, Jun. 13, 1984, 8415092

Int. Cl.[5] A61K *37/02*; C07K *7/50*; A23K *1/00*

U.S. Cl. 514—9 **15 Claims**

1. An ester derivative of deglucoteicoplanin of the formula



wherein

R represents a methyl or ethyl group, a benzyl group, a hydroxy (C_1–C_4)alkyl group, or a halo(C_1–C_4)alkyl group

R_1 represents hydrogen or an amino-protecting group,

A, B, and Z each individually represent a hydrogen group or a pharmaceutically acceptable acid addition salt thereof.

4,954,484

PARASITICIDES AND INSECTICIDES

Jean-Claude Gehret, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

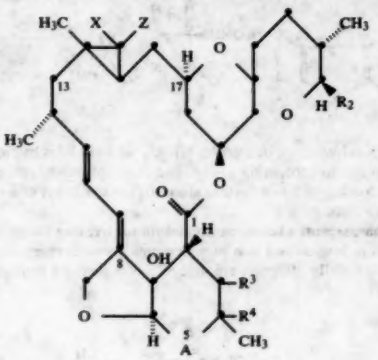
Filed Mar. 24, 1988, Ser. No. 172,616

Claims priority, application Switzerland, Mar. 27, 1987, 1180/87

Int. Cl.[5] C07D *493/22*; A61K *31/365*

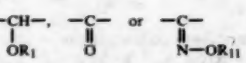
U.S. Cl. 514—30 **13 Claims**

1. A compound of formula I



(I)

in which
A is a



group wherein R_1 is hydrogen, R_5—C(O), $Si(R_6)(R_7)(R_8)$ or 2,3,4,6-tetraacetyllglucopyranosyl;

R_5 is C_1–C_{10}-alkyl, C_1–C_{10}-haloalkyl, a phenyl or a benzyl, which is unsubstituted or its substituted by at least one substituent selected from the group consisting of halogen, C_1–C_3-alkyl, C_1–C_3-haloalkyl, C_1–C_3-alkoxy, C_1–C_3-haloalkoxy, cyano and nitro;

R_6, R_7 and R_8 independently of each other are C_1–C_4-alkyl, benzyl or phenyl; R_{11} is hydrogen, $R_5C(O)Si(R_6)(R_7)(R_8)$ C_1–C_8-alkyl or C_3–C_6-cycloalkyl; R_2 is methyl, ethyl isopropyl, sec.-butyl or a —$C(CH_3)$=CH—E group wherein E is methyl, ethyl or isopropyl;

R_3 and R_4 together represent a bond between the two carbon atoms to which they are bound, or together represent a —C(X')(Z')— group wherein Z' and Z' each represents, independently of the other, hydrogen or halogen; and

X and Z each represents, independently of the other, hydrogen or halogen.

4,954,485

2',3'-DIDEOXY-4-THIO-URIDINE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND ANTIVIRUS AGENTS USED THEM

Hidetoshi Yoshioka; Eiji Kojima; Shuji Ishida; Hiroyuki Yoshioka, and Kunichika Murakami, all of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

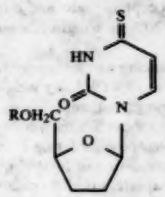
Filed Jun. 1, 1988, Ser. No. 200,903

Claims priority, application Japan, Oct. 20, 1987, 62-265083

Int. Cl.[5] A61K *31/505, 31/70*; C07D *239/56*

U.S. Cl. 514—49 **12 Claims**

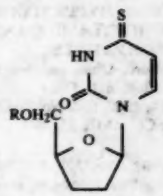
1. A 2',3'-dideoxy-4-thiouridine derivative having the formula (I)



(I)

wherein R is hydrogen or a hydroxyl-protecting group.

9. A method of treating a virus disease, comprising administering to an animal in need thereof, and antivirus-effective amount of a 2',3'-dideoxy-4-thiouridine derivative having the formula (I):



(I)

wherein R is hydrogen or a hydroxyl-protecting group, wherein said virus is selected from the group consisting of Moloney-murine leukemia virus, Rous sarcoma virus and human immunodeficiency virus.

4,954,486

FUROSEMIDE AS TINNITUS SUPPRESSANT

Paul S. Guth, New Orleans, La., assignor to Tulane Educational Fund, New Orleans, La.

Continuation of Ser. No. 363,408, Jun. 7, 1989, abandoned, which is a continuation of Ser. No. 95,697, Sep. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 937,460, Dec. 2, 1986, Pat. No. 4,735,968, which is a continuation of Ser. No. 742,347, Jun. 5, 1985, abandoned. This application Dec. 20, 1989, Ser. No. 456,201

Int. Cl.[5] A61K *31/635*

U.S. Cl. 514—158 **3 Claims**

1. A method of treating the symptoms of tinnitus in a person experiencing same comprising administering to said person a tinnitus-alleviating effective amount of furosemide.

4,954,487

PENETRATING TOPICAL PHARMACEUTICAL COMPOSITIONS

Eugene R. Cooper; Maurice E. Loomans, both of Cincinnati, and Richard R. Wickett, Ross, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 56,344, May 27, 1987, abandoned, which is a division of Ser. No. 516,005, Jul. 20, 1983, abandoned, which is a continuation of Ser. No. 296,706, Aug. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 167,167, Jul. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 149,104, May 12, 1980, abandoned, and a continuation-in-part of Ser. No. 1,974, Jan. 8, 1979, abandoned. This application Feb. 15, 1989, Ser. No. 312,354

Int. Cl.[5] A61K *31/60*

U.S. Cl. 514—159 **8 Claims**

1. A composition of matter for topical administration, said composition comprising

(a) from about 0.5% to about 35% by weight of a nonsteroidal anti-inflammatory agent selected from the group consisting of salicylic acid, ibuprofen, sulindac, naproxen,

ketoprofen, ethofenamate, and indomethacin, and the pharmaceutically-acceptable salts and esters thereof;

(b) from 0% to about 70% by weight ethanol or 2-propanol; and

(c) a penetration-enhancing carrier consisting essentially of

(i) from about 10% to about 98% by weight of the composition of propylene glycol; and

(ii) from about 1% to about 5% by weight of the composition of a cell envelope-disordering compound selected from the group consisting of methyl myristate, methyl laurate, methyl caprate, ethyl myristate, ethyl laurate, ethyl caprate, myristyl acetate, lauryl acetate and capric acetate.

4,954,488

METHOD OF TREATING HYPERALDOSTERONISM USING 17β-CYCLOPROPYLAMINOANDROSTENE DERIVATIVES

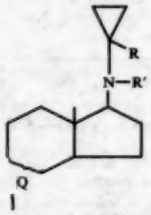
J. O'Neal Johnston, Milford, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 14, 1989, Ser. No. 366,551

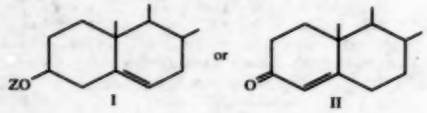
Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—177 **6 Claims**

1. A method for treating hyperaldosteronism which comprises administering to a patient having said condition a therapeutically effective amount of a compound of the



wherein R is hydrogen or methyl; R' is hydrogen, C_1–C_4 alkyl or cyclopropyl; and Q is



wherein Z is hydrogen, alkanoyl of 1–10 carbon atoms, cyclopentane-alkanoyl or benzene-alkanoyl wherein the alkanoyl portion of the cyclopentane-alkanoyl or benzene-alkanoyl contains up to 4 carbon atoms.

4,954,489

PENICILLINS HAVING A SUBSTITUTED ACRYLAMIDO SIDE CHAIN

Roger J. Ponsford, and Andrew V. Stachulski, both of Betchworth, England, assignors to Beecham Group p.l.c, England

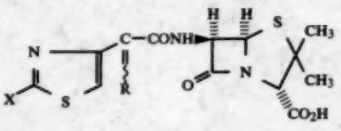
Filed Apr. 5, 1989, Ser. No. 333,554

Claims priority, application United Kingdom, Apr. 6, 1988, 8808032; Aug. 4, 1988, 8818513; Sep. 26, 1988, 8822511

Int. Cl.[5] A61K *31/43*; C07D *499/12, 499/54*

U.S. Cl. 514—195 **19 Claims**

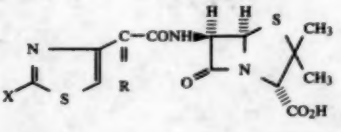
1. A compound of formula (I) or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof:



(I)

wherein X is hydrogen or a group NHR^1, wherein R^1 is hydrogen or an amino protecting group, and R is optionally substituted cycloalkyl of 5 to 8 carbon atoms or cycloalkenyl of 5 to 8 carbon atoms.

8. A pharmaceutical composition useful for treating bacterial infections in human and non-human animals which comprises an anti-bacterially effective amount of a compound f formula (I):



(I)

or a pharmaceutically acceptable salt or in-vivo hydrolysable ester thereof wherein X is hydrogen or a group NHR^1, wherein R^1 is hydrogen or an amino protecting group, and R is optionally substituted cycloalkyl of 5 to 8 carbon atoms or cycloalkenyl, in combination with a pharmaceutically acceptable carrier.

4,954,490

11 β-SUBSTITUTED PROGESTERONE ANALOGS

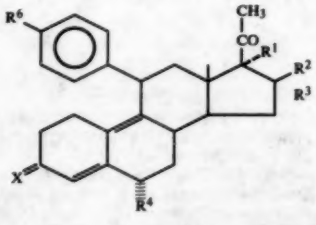
C. Edgar Cook, Durham; Mansukh C. Wani, Research Triangle Park; Y.-W Lee, Chapel Hill, all of N.C.; Jerry R. Reel, Delmar, N.Y., and Douglas Rector, Raleigh, N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Filed Jun. 23, 1988, Ser. No. 210,503

Int. Cl.[5] A61K *31/56*; C07J *1/00*

U.S. Cl. 514—176 **31 Claims**

1. An 11β-aryl-19-norprogesterone of the formula:



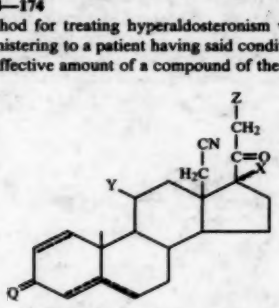
wherein R^1 is $OC(O)CH_3$, or $OC(O)R^5$, wherein R^5 is C_{2-8} alkyl, C_{2-8} alkenyl, C_{2-8} alkynyl or aryl, R^2 is H, R^3 is H, C_{1-4} alkyl, C_{2-4} alkenyl or C_{2-4} alkynyl, R^4 is H, CH_3, F or Cl, or R^6 is H, $(CH_3)_2N$, CH_3O, CH_3CO, CH_3S, CH_3SO, CH_3SO_2, and X' is O or $NOCH_3$.

4,954,491
METHOD OF TREATMENT USING 18-CYANOPROGESTERONE DERIVATIVES

J. O'Neal Johnston, Milford, and Gene W. Holbert, Loveland, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jan. 27, 1989, Ser. No. 303,367
Int. Cl.[5] A61K *31/57*; C07J *9/00*, *5/00*
U.S. Cl. 514—174 6 Claims

1. A method for treating hyperaldosteronism which comprises administering to a patient having said condition a therapeutically effective amount of a compound of the formula



wherein X is H or OH; Y is H, OH or O(C_{2-6} Alkanoyl); Z is H, OH or O(C2-6 Alkanoyl); Q is 0, β-OH or β-O(C_{2-6} Alkanoyl); and the dotted lines indicate the optional presence of a double bond with the dotted lines showing optional double bonds at the 4- and 5-positions being selected in such a way that a maximum of one of those dotted lines is a double bond and that double bond is located at the 4-position when Q is 0 and at the 5-position when Q is β-OH or β-O(C_{2-6} Alkanoyl); and the hydrogen at the 5-position is β or β when no double bond is present.

4,954,492
SYNTHETIC GTF CHROMIUM MATERIAL FOR DECREASING BLOOD LIPID LEVELS AND PROCESS THEREFOR

Ned L. Jensen, Martinez, Calif., assignor to The William Seroy Group, Walnut Creek, Calif.

Division of Ser. No. 186,149, Apr. 26, 1988, which is a continuation-in-part of Ser. No. 512,111, Jul. 8, 1983, abandoned. This application Nov. 14, 1989, Ser. No. 416,371
Int. Cl.[5] A61K *31/555*; C07D *213/80*
U.S. Cl. 514—188 4 Claims

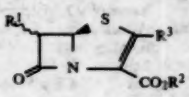
1. A method of decreasing blood lipid levels in a mammal, comprising administering an effective amount of a chromium-nicotinate GTF material to the mammal, wherein the chromium-nicotinate GTF material is obtained by reacting an alkali metal salt of nicotinic acid with a pharmaceutically acceptable trivalent chromium salt.

4,954,493
6-SUBSTITUTED PENEM ESTERS AS ANTI-INFLAMMATORY AND ANTI-DEGENERATIVE AGENTS

Marco Alpegiani; Ettore Perrone, both of Milan; Piergiuseppe Orezzi, Quarto, Genova; Paolo Carminati, Milan, and Giuseppe Cassinelli, Voghera, Pavia, all of Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Filed Jun. 14, 1988, Ser. No. 206,375
Claims priority, application United Kingdom, Jun. 19, 1987, 8714413
Int. Cl.[5] C07D *499/00*; A61K *31/425*
U.S. Cl. 514—195 3 Claims

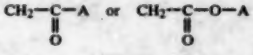
1. A method of treating or managing elastase-mediated diseases comprising the administration to mammalian species in need of such treatment an effective amount of a 6-substituted penem ester of formula (I):



(I)

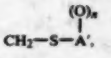
wherein R^1 is
(1) chloro, bromo or fluoro;
(2) C_1–C_4 alkyl;
(3) C_1–C_4 alkoxy;
(4) phenyl, phenoxy or benzyl; or
(5) sulfonyloxy RSO_2O—, wherein R is either C_1–C_4 alkyl, phenyl, naphthyl, benzyl, p-aminobenzyl, p-tolyl or adamantyl;

R^2 is
(1) C_1–C_4 alkyl;
(2) benzyl;
(3) diphenylmethyl;
(4)



wherein A represents a group selected from methyl, ethyl, isopropyl, tert-butyl, benzyl, p-nitrobenzyl and p-methoxybenzyl; or
(5) —$(CH_2)_m$—COOB wherein B is a hydrogen atom or a negative charge and m is 1, 2 or 3; and

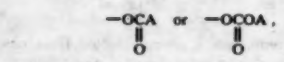
R^3 is —CH=CH—R_7 wherein R_7 is hydrogen, C_1–C_4 alkyl, or
(a)



where n represents 1 or 2,
(b) CH_2SA',
(c) CH_2OA',
(d) CH_2A',
(e) OZ or SZ,
(f) carboxy,
(g) COOA,
(h) COA",
(i) unsubstituted phenyl or (C_1–C_4 alkyl) phenyl;
(j) a heterocyclic group selected from, tetrazole, triazole, 1,3,4-thiadiazole, tetrazolo/1,5-b/pyridazine, 1,3-thiazole, pyridine, pyrazole, imidazole, furane, oxazole and indole, unsubstituted or substituted by an atom or group chosen from halogen, C_1–C_4 alkyl, oxo, phenyl, benzyl, amino, carboxy, C_1–C_3 alkoxycarbonyl, hydroxymethyl and hydroxy,
(k) fluoromethyl, difluoromethyl or trifluoromethyl,
(l) amino (C_1–C_4 alkyl), or
(m) (N-phthalimido)-, (N-succinimido)- or (N-methylamino)-methyl, wherein A is as defined above and wherein Z represents a heterocyclic group which is linked through a carbon atom and is selected from tetrazole, triazole, 1,3,4-thiadiazole, tetrazolo/1,5-b/-pyridazine, 1,3-thiazole, pyridine, pyrazole, imidazole, furane, oxazole, and indole, unsubstituted or substituted by an atom of group chosen from halogen, C_1–C_4 alkyl, oxo, phenyl, benzyl, amino, carboxy, C_1–C_3 alkoxycarbonyl, hydroxymethyl and hydroxy;

A' represents:
(i) an organic radical selected from C_1–C_4 alkyl unsubstituted or substituted by fluoro; benzyl; and phenyl either unsubstituted or substituted by one or more group or atom chosen from nitro, amino, aminoethyl, azidomethyl, (N-pyridinio)methyl, hydroxy, hydroxymethyl and chloro; or

(ii) a heterocyclic group selected from, tetrazole, triazole, 1,3,4-thiadiazole, tetrazolo/1,5-b/pyridazine, 1,3-thiazole, pyridine, pyrazole, imidazole, furane, oxazole, and indole, unsubstituted or substituted by an atom or group chosen from halogen, C_1–C_4 alkyl, oxo, phenyl, benzyl, amino, carboxy, C_1–C_3 alkoxycarbonyl, hydroxymethyl and hydroxy; and wherein A" is C_1–C_4 alkyl, phenyl or benzyl; and pharmaceutically acceptable salts thereof; the C_1–C_4 alkyl, C_1–C_4 alkoxy, phenyl, phenoxy, and benzyl groups in the definitions (2), (3), (4) and (5) or R^1, (1) and (2) of R^2 and of R^3 being either unsubstituted or substituted by radicals chosen from methyl, methoxy, trifluoromethyl, fluoro, chloro, bromo, cyano, carboxy, sulfoamino, amino, carbamoyl, carbamoyloxy, guanidino, C_1 or C_2 aminoalkyl, C_1–C_3 carbamoylalkyl and C_1–C_3 carbamoyloxyalkyl wherein the amino, guanidino, carbamoyl and carbamoyloxy radicals can be optionally substituted at the nitrogen atom(s) by one or two methyl or ethyl groups; methylsulfonyl, azido, C_2–C_5 alkoxycarbonyl, benzyloxycarbonyl, acetyloxymethyl, trifluoroacetyloxymethyl, carboxymethyl, (C_1–C_4 alkoxy)carbonylmethyl, hydroxy, acylated hydroxy



wherein A is as defined above; and formyloxy.

4,954,494

PYRIDYL-PYRIDAZINONE AND PYRIDYL-PYRAZOLINONE COMPOUNDS AND THEIR USE IN THE TREATMENT OF CONGESTIVE HEAT FAILURE

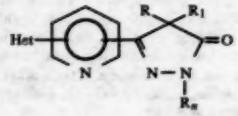
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale; William L. Studt, Harleysville, and William C. Faith, Ambler, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 11,490, Feb. 5, 1987, Pat. No. 4,826,835, which is a continuation-in-part of Ser. No. 790,426, Oct. 23, 1985, Pat. No. 4,783,463. This application Jan. 30, 1989, Ser. No. 303,879

Int. Cl.[5] **C07D** *401/14;* **A61K** *31/44, 31/495, 31/535*

U.S. Cl. 514—210 **19 Claims**

1. A compound of the formula:



where:

Het is imidazol-1-yl or 1,2,4-triazol-1-yl;

R_α is hydrogen, alkyl, aralkyl, acetyl, propionyl, benzoyl, carbalkoxy, carbamyl, carbalkoxyalkyl, hydroxyalkyl, alkoxyalkyl or amidino;

R_1 is hydrogen, alkyl or aralkyl; and

R is hydrogen or $-(CH_2)_y-Y$ where y is 1–3 and Y is hydrogen, $-O-R_{\alpha'}$ $-S-R_\alpha$ or

where

R_α is hydrogen, alkyl or acetyl, propionyl, benzoyl and;

R_β is hydrogen or alkyl; and

R_α and R_β together with the nitrogen to which they are attached may form a 3 to about 6 membered ring selected from the group consisting of aziridinyl, azetidinyl, piperidyl, N-methylimidazolidinyl, piperazinyl, substituted piperazinyl where the substituent may be

N-methyl,

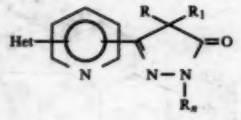
N-benzyl or

N-phenyl,

morpholinyl or

thiomorpholinyl; or a pharmaceutically acceptable salt thereof.

11. A method for increasing cardiotonic contractility in a human or other mammal requiring such treatment which comprises administering thereto an effective inotropic amount of a compound of the formula:



where:

Het is imidazol-1-yl or 1,2,4-triazol-1-yl;

R_α is hydrogen, alkyl, aralkyl, acetyl, propionyl, benzoyl, carbalkoxy, carbamyl, carbalkoxyalkyl, hydroxyalkyl, alkoxyalkyl or amidino;

R_1 is hydrogen, alkyl or aralkyl; and

R is hydrogen or $-(CH_2)_y-Y$ where y is 1–3 and Y is hydrogen, $-O-R_{\alpha'}$ $-S-R_\alpha$ or

where

R_α is hydrogen, alkyl or acetyl, propionyl, benzoyl and;

R_β is hydrogen or alkyl; and

R_α and R_β together with the nitrogen to which they are attached may form a 3 to about 6 membered ring selected from the group consisting of aziridinyl, azetidinyl, piperidyl, N-methylimidazolidinyl, piperazinyl, substituted piperazinyl where the substituent may be

N-methyl,

N-benzyl or

N-phenyl,

morphonlinyl or

thiomorpholinyl; or a pharmaceutically acceptable salt thereof.

4,954,495

FUNGICIDES AND PLANT-GROWTH CONTROLLING AGENTS

Thomas Strumpf, Potsdam; Horst Lyr, Eberswalde; Dieter Zanke, Potsdam-Babelsberg; Gerlinde Zollfrank nee Baumann, Potsdam, all of German Democratic Rep.; Gyula Oros; Ferenc Viranyi, both of Budapest, Hungary, and Tibor Ersek, Columbia, Mo., assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Continuation-in-part of Ser. No. 835,608, Mar. 3, 1986. This application Apr. 26, 1989, Ser. No. 344,009

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 273728

Int. Cl.[5] **A01N** *37/12, 37/44, 43/54*

U.S. Cl. 514—231.2 **3 Claims**

1. A fungicidal composition effective against Plasmopora halstedii which comprises a synergistic effective amount of:

(a) Tridemorph; and

(b) Benalaxyl;

in a weight ratio of substantially 5:1 to substantially 1:1; together with a fungicidally acceptable inert carrier.

4,954,496

CYCLOHEXANE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Teruo Oku; Chiyoshi Kasahara; Takehiko Ohkawa, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

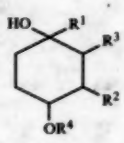
Filed Jul. 28, 1989, Ser. No. 386,232

Claims priority, application United Kingdom, Aug. 12, 1988, 8819257; Apr. 10, 1989, 8908005; Apr. 28, 1989, 8909794

Int. Cl.[5] A61K *31/335, 31/535;* **C07D** *303/22, 413/12*

U.S. Cl. 514—231.5 **4 Claims**

1. A cyclohexane derivative of the formula:



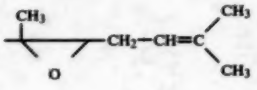
(I)

wherein

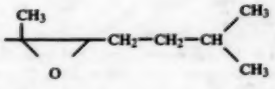
R^1 is halomethyl; or arylthiomethyl which may have amino, lower alkoxy or acylamino,

R^2 is lower alkoxy,

R^3 is



or



and

R^4 is hydrogen, lower alkylcarbamoyl, lower alkylcarbamoyloxy(lower)alkylcarbamoyl, heterocyclic carbonyl or heterocyclic carbamoyl,

or salt thereof.

4. A pharmaceutical composition which comprises, as an active ingredient, the cyclohexane derivative of claim 1 and pharmaceutically acceptable carrier(s).

4,954,497

ACRYLIC ACID MORPHOLIDES AND FUNGICIDAL COMPOSITIONS

Toshiya Kamikado; Yasuyuki Kondo, both of Hyogo; Kazuho Matsuura, Kyoto, and Junji Yamada, Nara, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

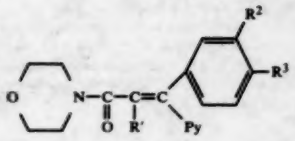
Filed Feb. 16, 1989, Ser. No. 310,926

Claims priority, application Japan, Feb. 22, 1988, 63-039130; May 24, 1988, 63-126358

Int. Cl.[5] A01N *43/84;* **C07D** *413/06*

U.S. Cl. 514—235.5 **9 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen or a lower alkyl group; R^2 and R^3 independently are a lower alkoxyl group; and Py is an optionally substituted pyridyl group with the substitutents being non heterocyclic groups, or a salt thereof.

9. A fungicidal composition which comprises an effective fungicidal amount of a compound claimed in claim 1 and a carrier.

4,954,498

TRICYCLIC BENZIMIDAZOLE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

Alfred Mertens, Schriesheim; Wolfgang von der Saal, Weinheim; Erwin Boehm, Ladenburg, and Klaus Strein, Hemsbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

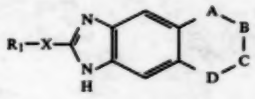
Filed Jan. 15, 1988, Ser. No. 144,514

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701277

Int. Cl.[5] A61K *31/505;* **C07D** *487/04, 471/04*

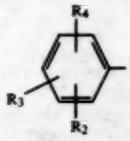
U.S. Cl. 514—254 **8 Claims**

1. A tricyclic benzimidazole compound of the formula:



(I)

wherein R_1 is a phenyl of the formula:



wherein R_2, R_3 and R_4 can be the same or different and each id hydrogen, methoxy, ethoxy, chlorine, methyl, hydroxyl, dimethylamino, diethylamino, imidazol-l-yl, allyloxy, cyano or aminocarbonyl or R_1 is a methylenedioxyphenyl or a pyridyl, quinolinyl, pyridazinyl, pyrazolyl or thienyl or a methyl-substituted derivative thereof or, when X is a valency bond, besides the above groups, R_1 is methyl, n-hexyl or hydroxyl,

X is a valency bond, C_1–C_4 alkylene or vinylene, imino or amide (—CONH—) and wherein A and C are nitrogen which can be substituted by hydrogen, C_1–C_6 alkyl or C_3–C_7 cycloalkyl, and B and D are carbon which can be substituted by hydrogen, C_1–C_6 alkyl, C_3–C_7 cycloalkyl, hydroxyl or oxo, and wherein the six-membered ring containing A, B, C and D can be saturated, partly unsaturated or unsaturated, the tautomers thereof and the physiologically acceptable salts thereof with inorganic and organic acids together with the optically active compounds and racemates.

5. A pharmaceutical composition for the treatment and inhibition of the aggregation of thrombocytes and erythrocytes, to lower blood pressure and increase the power of the heart wherein said composition contains a pharmaceutically

effective amount of at least one compound of claim 1 in a pharmaceutically acceptable carrier.

6. A method of treatment and inhibition of the aggregation of thrombocytes and erythrocytes, to lower blood pressure and increase the power of the heart comprising administering an effective amount of at least one of a pharmaceutically acceptable compound of claim 1.

4,954,499

PYRIDAZINONE DERIVATIVES

Helmut Prücher, Heppenheim, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

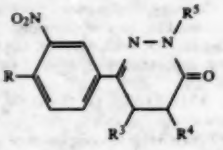
Filed Feb. 16, 1988, Ser. No. 156,512

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704879

Int. Cl.[5] C07D *413/04*; A61F *31/535*

U.S. Cl. 514—247 **20 Claims**

1. A pyridazinone derivative of the formula



wherein

R is F, Cl, Br, I or R^1R^2N,

R^1 and R^2 are each independently H, C_{1-4}-alkyl or benzyl,

R^3, R^4 and R^5 are each independently H or C_{1-4}-alkyl,

or a pharmaceutically acceptable salt thereof, wherein, if R is benzylamino, R^3 is CH_3 and R^4 is H, R^5 is C_{1-4}-alkyl.

4,954,500

AROMATIC 2-AMINOALKYL-1,2-BENZOISOTHIAZOL-3(2H)ONE-1,1-DIOXIDE DERIVATIVES

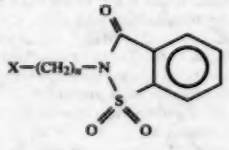
Marcel Hibert, Strasbourg, and Maurice W. Gittos, Plobsheim, both of France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 366,824, Jun. 15, 1989, Pat. No. 4,920,118, which is a division of Ser. No. 244,894, Sep. 12, 1988, Pat. No. 4,857,526, which is a division of Ser. No. 158,432, Feb. 22, 1988, Pat. No. 4,789,676, which is a division of Ser. No. 836,276, Mar. 5, 1986, Pat. No. 4,748,182. This application Feb. 2, 1990, Ser. No. 475,468

Int. Cl.[5] A61K *31/495*; C07D *241/42*

U.S. Cl. 514—249 **10 Claims**

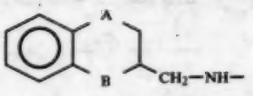
1. An aromatic 2-aminoalkyl-1,2-benzoisothiozol-3(2H)one-1,1-dioxide derivative having the formula



wherein

n is an integer of from 2 to 5;

X is



wherein A is =NR' and B is =NR" wherein R' is hydrogen or methyl and R" is hydrogen or methyl, or a pharmaceutically acceptable acid addition salt thereof.

8. A method for lowering blood pressure in a person in need thereof, which comprises the administration to said patient of an antihypertensive effective amount of a compound of one of claims 1–6.

4,954,501

PIPERAZINE SUBSTITUTED 6-PHENYLDIHYDRO-3(2H)-PYRIDAZINONES, AND PHARMACEUTICAL PREPARATIONS CONTAINING THESE

Rolf Herter, Schwabach; Peter Mörsdorf, Langenzenn; Volker Pfahlert, Nuremberg; Heidrun Engler, Cadolzburg; Helmut Schickaneder, Eckental, and Kurt-Henning Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Heumann Pharma GmbH & Co., Nuremberg, Fed. Rep. of Germany

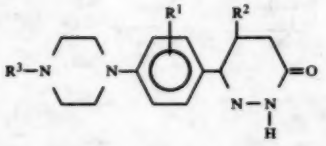
Filed Sep. 21, 1988, Ser. No. 247,868

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804490

Int. Cl.[5] A61K *31/50*; C07D *237/06*

U.S. Cl. 514—252 **7 Claims**

1. A 6-(4-piperazino)-phenyl-4,5-dihydro-3(2H)-pyridazinone, comprising



wherein R^1 is nitro or cyano; R^2 is selected from the group consisting of hydrogen, methyl and hydroxymethyl and R^3 is selected from the group consisting of a C_1–C_6 alkyl group, a C_1–C_6 alkyl group substituted with amino or hydroxy, a phenyl group, a naphthyl group, a heteroaryl group wherein the hetero atom is selected from the group consisting of O, S and N, a substituted such aryl or heteroaryl group wherein the substituents are selected from the group consisting of halogen, C_1–C_3 alkyl and C_1–C_3 alkoxy, a cyano group, an acyl group with the proviso that, when said acyl group is aroyl, the aroyl ring may be substituted with substituents selected from the group consisting of halogen, C_1–C_3 alkyl and C_1–C_3 alkoxy, a carbonyl group and a C_1–C_6 alkoxycarbonyl group, and a physiologically acceptable salt thereof.

4,954,502

1-INDOLYALKYL-4-(SUBSTITUTED-PYRIDINYL)PIPERAZINES

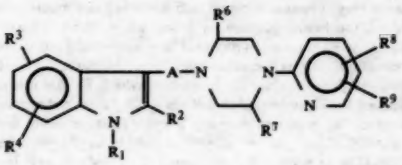
David W. Smith, Clinton; Frank D. Yocca, Madison; Joseph P. Yevich, Southington, and Ronald J. Mattson, Meriden, all of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation-in-part of Ser. No. 204,845, Jun. 10, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 338,253

Int. Cl.[5] A61K *31/495*, *31/44*; C07D *401/14*

U.S. Cl. 514—253 **58 Claims**

1. A compound of Formula I aor the pharmaceutically acceptable acid addition salts thereof,

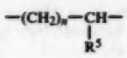


wherein

R^1 and R^2 are independently selected from hydrogen and lower alkyl, wherein lower means C_{1-4};

R^3, R^4, R^8 and R^9 are independently selected from hydrogen, lower alkyl, lower alkoxy, carboxamide, halogen, trifluoromethyl and thio-lower alkyl, with the proviso that R^8 and R^9 cannot both be hydrogen at the same time;

A is a C_{5-7} cycloalkanyl or cycloalkenyl ring, or A is



wherein n is an integer from 1 to 3 and R^5 is the same as R^1; and

R^6 and R^7 are independently selected from hydrogen, methyl or R^6 and R^7 can be taken together as a methylene bridge.

57. A method for ameliorating of depression in a mammal comprising administration to said mammal of an effective antidepressant amount of a compound claimed in claim **1**.

58. A antidepressant pharmaceutical composition in dosage unit form suitable for systemic administration to a mammalian host comprising a pharmaceutical carrier and from about 1 to 500 mg of an active compound selected from the compounds claimed in claim **1**.

4,954,503

3-(1-SUBSTITUTED-4-PIPERAZINYL)-1H-INDAZOLES

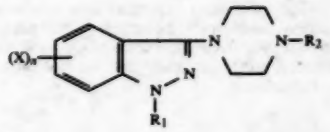
Joseph T. Strupczewski, Flemington, N.J., and Kenneth J. Bordeau, Upper Black Eddy, Pa., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Sep. 11, 1989, Ser. No. 405,161

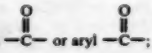
Int. Cl.[5] **A61K** *31/495*; **C07D** *401/14, 403/04, 403/14*

U.S. Cl. 514—254 **187 Claims**

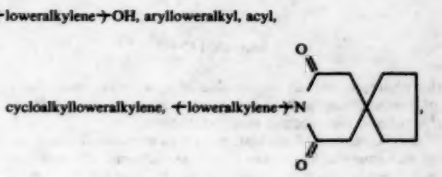
1. A compound of the formula

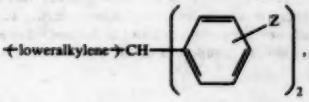


wherein R_1 is hydrogen, lower alkyl, arylloweralkyl, acyl, cycloalkylloweralkylene, and phenylsulfonyl; wherein the term "aryl" signified a phenyl group optionally substituted by one or more hydrogen or halogen atoms or loweralkyl, loweralkoxy, trifluoromethyl, nitro or amino groups; the term "cycloalkyl" refers to a saturated hydrocarbon possessing at least one carbocyclic ring of three to seven carbon atoms; and the term "acyl" refers to a substituent having the formula loweralkyl

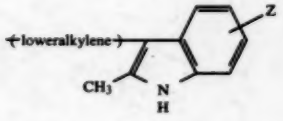


and R_2 is hydrogen, lower alkyl, hydroxyloweralkyl of the formula -(loweralkylene)-OH, arylloweralkyl, acyl, cycloalkylloweralkylene,

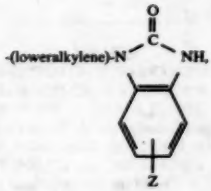




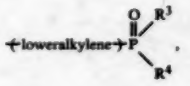
where Z is selected from hydrogen, halogen, loweralkoxy, CF_3, NO_2 and NH_2;



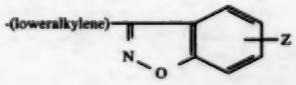
where Z is as defined above,



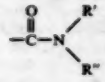
where Z is as defined above;



where R_3 and R_4 are each independently hydrogen and loweralkyl;

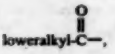


where Z is as defined above;



where R' and R" are each independently hydrogen and loweralkyl; X is hydrogen, loweralkyl, hydroxyl, halogen, loweralkoxy, CF_3, NO_2 and NH_2; n is an integer of 1 to 4, with the proviso that if X is a chlorine atom attached at the 5 or 6

position of the benzene ring, R_2 cannot be hydrogen or lower-alkyl and R_1 cannot be hydrogen or

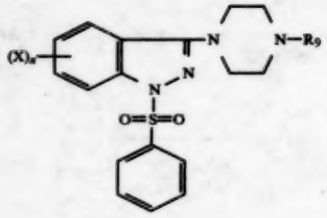


the pharmaceutically acceptable acid addition salts thereof; and where applicable the geometric and optical isomers thereof and the racemic mixtures thereof.

185. A method of alleviating pain in a mammal which comprises administering a pain alleviating amount of a compound as defined in claim 1.

186. A method of alleviating psychoses in a mammal in need thereof which comprises administering to the mammal a psychoses alleviating amount of a compound as defined in claim 1.

187. A compound of the formula



wherein R_9 is loweralkyl, CN and n is an integer of 1 to 4; and X is hydrogen, loweralkyl, hydroxy, halogen, loweralkoxy, CF_3, NO_2, NH_2.

4,954,504

N_9-CYCLOPENTYL-SUBSTITUTED ADENINE DERIVATIVES HAVING ADENOSINE-2 RECEPTOR STIMULATING ACTIVITY

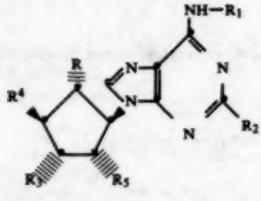
Jen Chen, Middlesex, and Alan J. Hutchison, Verona, all of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 137,554, Dec. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 931,327, Nov. 14, 1986, abandoned. This application May 13, 1988, Ser. No. 193,969

Int. Cl.[5] A61K *31/52*; C07D *473/18, 473/34*

U.S. Cl. 514—265 24 Claims

1. A compound of the formula



(I)

wherein R, R_3 and R_5 independently represent hydrogen or hydroxy provided that at least one of R, R_3 and R_5 represents hydroxy; R_1 represents hydrogen, lower alkyl, C_3–C_7-alkenyl, hydroxy-lower alkyl, optionally substituted cycloalkyl or optionally substituted cycloalkyl-lower alkyl, bicycloalkyl, bicycloalkyl-lower alkyl, adamantyl, tetrahydropyranyl, tetrahydrothiopyranyl, tetrahydropyranyl-lower alkyl, tetrahydrothiopyranyl-lower alkyl, adamantyl-lower alkyl, aryl-hydroxy-lower alkyl, aryl, aryl-lower alkyl, aryl-C_3–C_6-cycloalkyl, 9-fluorenyl, 9-fluorenyl-lower alkyl or cycloalkenyl-lower alkyl; or R_1 represents a bicyclic benzo-fused 5 or 6-membered saturated carbocyclic radical or a benzo-fused 5 or 6-membered saturated heterocyclic radical containing a heteroatom selected from oxygen and sulfur directly attached to the fused benzene ring, any said bicyclic radicals being optionally substituted on the benzo portion by lower alkyl, lower alkoxy or halogen, or R_1 represents any said bicyclic radical substituted-lower alkyl; R_2 represents hydrogen, halogen, —S—R_1', —NR_6—R_1', or —NH—R_1' in each of which R_1' has meaning as defined for R_1 provided that R_1 in —SR_1' does not represent hydrogen; R_6 represents lower alkyl; [R_4 represents lower alkoxymethyl or lower alkylthiomethyl; or]R_4 represents —$CONHR_6$ in which R_6 represents C_2–C_4-alkyl, aryl-lower alkyl, C_3–C_6cycloalkyl or hydroxy-lower alkyl; a pharmaceutically acceptable ester derivative thereof in which free hydroxy groups are esterified in form of a pharmaceutically acceptable ester, and the term optionally substituted cycloalkyl in the above definitions represents C_3–C_7cycloalkyl, unsubstituted or substituted by hydroxy, lower alkyl or a substituent W—Z in which W represents a direct bond or lower alkylene, and Z represents cyano, carboxy derivatized in the form of a pharmaceutically acceptable ester or amide; or a pharmaceutically acceptable salt thereof.

22. A method of stimulating adenosine-2 receptors in mammals comprising the administration to a mammal in need thereof of an effective amount of a compound of claim 1 or of a pharmaceutical composition comprising said compound.

23. A method of treating cardiovascular conditions responsive to adenosine-2 receptor stimulation in mammals comprising the administration to a mammal in need thereof of an effective adenosine-2 receptor stimulating amount of a compound of claim 1 or of a pharmaceutical composition comprising a said compound.

24. A method of treating hypertension in mammals comprising the administration to a mammal in need thereof of an effective antihypertensive amount of a compound of claim 1 or of a pharmaceutical composition comprising a said compound.

4,954,505

USE OF OXOQUINAZOLINE DERIVATIVES IN THE TREATMENT OF HYPERURICAEMIA

Gerhard Rauber, Ingelheim am Rhein, and Roland Stechert, Bingen am Rhein, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

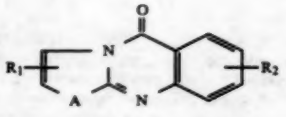
Division of Ser. No. 323,511, Mar. 14, 1989, which is a division of Ser. No. 152,190, Feb. 4, 1988, Pat. No. 4,861,784. This application Sep. 25, 1989, Ser. No. 411,793

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1987, 3704203

Int. Cl.[5] A61K *31/505*

U.S. Cl. 514—267 1 Claim

1. A method for treating hyperuricaemia or a disease state caused thereby, which method comprises orally administering to a host suffering from hyperuricaemia or a disease state caused thereby, a therapeutically effective amount of a compound of the formula



(I)

wherein

A represents —CH=N—

R_1 represents (a) hydrogen, a lower alkyl or alkoxy group or a condensed-on benzene ring or (b) a cyano, tetrazol-5-yl or —COR_3 group,

R_2 represents a cyano, tetrazol-5-yl or COR_4 group or, if R_1 has one of the meanings given in (b), R_2 may also represent hydrogen, a lower alkyl or alkoxy group or a condensed-on benzene ring,

R_3 represents a lower alkoxy group, an amino, hydrox-

ylamino or tetrazol-5-yl amino group or, if R_2 does not represent hydrogen, R_3 may also represent a hydroxy group and

R_4 represents a lower alkoxy group, a hydroxy, amino, hydroxylamino or tetrazol-5-yl amino group,

or a pharmaceutically acceptable salt thereof.

4,954,506

N-HETEROCYCLIC-N-(4-PIPERIDINYL)AMIDES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUCH COMPOUNDS

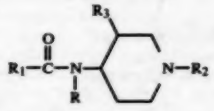
Jerome R. Bagley, North Plainfield, and H. Kenneth Spencer, Chatham, both of N.J., assignors to BOC, Inc., Murray Hill, New Providence, N.J.

Division of Ser. No. 362,119, Jun. 6, 1989, Pat. No. 4,916,142, which is a continuation-in-part of Ser. No. 9,857, Feb. 2, 1987, Pat. No. 4,791,112. This application Jan. 22, 1990, Ser. No. 468,381

Int. Cl.[5] A61K *31/505, 31/445;* **C07D** *239/42*

U.S. Cl. 514—272 **8 Claims**

1. A compound having the formula:



and the optically active isomeric forms, and the pharmaceutically acceptable acid addition salts thereof, in which formula:

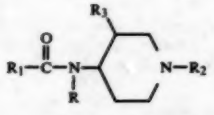
R is pyrimidinyl which may be unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, or combinations thereof;

R_1 is selected from the group consisting of furanyl lower-alkyl, thienyl lower-alkyl, pyrrolyl, pyrrolyl lower-alkyl, and lower-alkyl and lower-cycloalkyl of 2 to 6 carbons, wherein the R_1 groups may be either unsubstituted or substituted with the substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen or combinations thereof;

R_2 is selected from the group consisting of thienyl lower-alkyl, thienyl hydroxy lower-alkyl, pyrazoyl lower-alkyl, and (4,5-dihydro-5-oxo-1H-tetrazol-1-yl) lower-alkyl, which may be substituted in the 4- position with a group selected from lower-alkyl, wherein the R_2 group may be either unsubstituted or substituted with the substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, or combinations thereof; and

R_3 is hydrogen.

6. A narcotic antagonistic or analgesic composition comprising a non-toxic pharmaceutically acceptable carrier and an analgesically or antagonistically effective amount of a compound having the formula:



and the optically active isomeric forms, and the pharmaceutically acceptable acid addition thereof, in which formula:

R is pyrimidinyl which may be unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, or combinations thereof;

R_1 is selected from the group consisting of furanyl, furanyl lower-alkyl, thienyl, thienyl lower-alkyl, pyrrolyl, pyrrolyl lower- alkyl, lower-alkyl, lower-cycloalkyl, and lower-alkoxy lower-alkyl of 2 to 6 carbons, wherein the R_1 groups may be either unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower- alkyl, lower-alkylthio, oxygen, or combinations thereof;

R_2 is selected from the group consisting of phenyl lower-alkyl, thienyl lower-alkyl, thienyl hydroxy lower-alkyl, pyrazoyl lower-alkyl, and (4,5-dihydro-5-oxo-1H-tetrazol-1-yl) lower-alkyl, which may be substituted in the 4-position with a group selected from lower-alkyl, wherein the R_2 group may be either unsubstituted or substituted with substituents independently selected from the group consisting of halogen, lower-alkyl, lower-alkoxy, halogenated lower-alkyl, lower-alkylthio, oxygen, or combinations thereof; and

R_3 is methyl.

4,954,507

1-TERTIARY-ALKYL-SUBSTITUTED NAPHTHYRIDINE CARBOXYLIC ACID ANTIBACTERIAL AGENTS

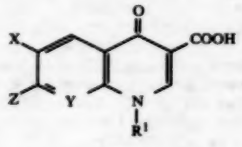
Abraham Weber, Sant-Mande; Daniel Bouzard, Franconville; Munir Essiz, Noisy le Grand; Pierre Di Cesare, Meaux; Jean-Pierre Jacquet, Menestreau-en-Villette, and Philippe Remuzon, Paris, all of France, assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 99,231, Sep. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 916,752, Oct. 8, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 287,502

Int. Cl.[5] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—300 **16 Claims**

1. A compound having the formula



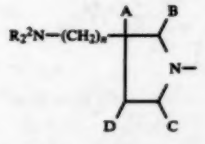
wherein:

R^1 is $—C(CH_3)_3$ optionally substituted by 1-3 fluorine atoms;

X is a member of the group selected from F, Cl, Br, CF_3, and CCl_3;

Y is N; and

Z is



wherein each R^2 is independently selected from H, unsubstituted and substituted alkyl having 1 to 6 carbon atoms wherein the substituent is independently selected from 1-3 hydroxy, fluoro, chloro, amino, alkylamino, trifluoroacetylamino, and phenyl groups; cycloalkyl having 3 to 6 carbon atoms, and cycloalkenyl having 3 to 6 carbon atoms; and wherein A, B, C, and D, are independently selected from H; unsubstituted and substituted lower alkyl having 1 to 4 carbon atoms wherein the substituent is independently selected from 1-3 hydroxy, fluoro, chloro, amino, alkylamino, trifluoroacetylamino, and phenyl groups; amino; hydroxy; fluoro; chloro; and phenyl

groups; and wherein n is selected from the integers 0, 1, 2, and 3, and wherein when each of the R^2 is other than H, the R^2 group is independently selected from CH_3 and C_2H_5,

and pharmaceutically acceptable acid addition and base salts thereof.

4,954,508

PHARMACOLOGICALLY ACTIVE PYRAZOLOPYRIDINES

Giorgio Winters, Arese, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

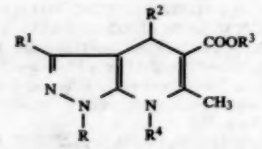
Continuation-in-part of Ser. No. 562,796, Dec. 19, 1983, abandoned. This application Dec. 20, 1988, Ser. No. 286,917

Claims priority, application United Kingdom, Dec. 20, 1982, 8236131

Int. Cl.[5] A61K *31/44*; C07D *471/04*

U.S. Cl. 514—303 **7 Claims**

1. A 4,7-dihydropyrazolo[3,4-b]pyridine-5-carboxylic acid compound of the formula:



wherein R represents a methyl group; R^1 represents a C_4 alkyl group; R^2 represents a 2-methylphenyl group; R^3 represents a methyl group; and R^4 represents hydrogen; or a physiologically acceptable salt thereof.

4,954,509

ISOQUINOLINE DERIVATIVES AND THEIR USE AS ANALGESICS

Vittorio Vecchietti, and Giuseppe Giardina, both of Baranzate, Italy, assignors to Dr. Lo. Zambeletti S.p.A., Italy

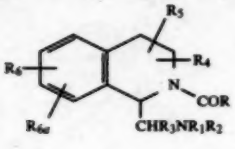
Filed Feb. 17, 1989, Ser. No. 312,648

Claims priority, application United Kingdom, Feb. 19, 1988, 8803919.1; Jun. 24, 1988, 8815089

Int. Cl.[5] A61K *31/47*; C07D *401.06*

U.S. Cl. 514—307 **10 Claims**

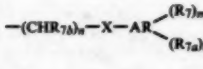
1. A compound, or a solvate or salt thereof, of formula (I):



(I)

in which:

RCO is an acyl group in which the group R has the formula (II):



(II)

in which

n is 0, 1 or 2;

m is 0, 1 or 2;

m' is 0, 1 or 2, provided $m+m' \leq 2$

X is a direct bond, or 0 S or NR_8 in which

R_8 is hydrogen or C_{1-6} alkyl;

Ar is either a single or fused ring carbocyclic aromatic group having 6 to 12 ring atoms or a single or fused ring heterocyclic aromatic group have 5 to 12 ring atoms, comprising up to four hetero atoms in each ring selected from oxygen, nitrogen and sulphur;

each of R_7 and R_{7a} is C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{1-6} haloalkyl, C_{2-6} haloalkenyl, C_{2-6} haloalkynyl, phenyl, phenylalkyl, hydroxy, C_{1-6} alkoxy, thiol, C_{1-6} alkylthio, C_{1-6} haloalkoxy, C_{1-6} haloalkylthio, halogen, NO_2, CN, CF_3, $—OCF_3$, $—OCHF_2$, $—OCF_2CF_2H$, $—OCCl_2CF_3$, $—COOR_9$, $—CONR_{10}R_{11}$, $—SO_3R_{12}$, $—SO_2NR_{13}R_{14}$ or $—COR_{15}$ in which each of R_9 to R_{15} is independently hydrogen, C_{1-6} alkyl, phenyl or phenylalkyl;

or, when m is 2 and m' is 0, two R_{7a} form a C_{2-6} polymethylene group;

and R_{7b} is hydrogen or C_{1-6} alkyl;

R_1 and R_2 are independently hydrogen, C_{1-6}alkyl, C_{2-6} alkenyl, C_{3-6} cycloalkyl or C_{4-12} cycloalkylalkyl groups or together form a C_{2-8} branched or linear polymethylene or C_{2-6} alkenylene group optionally interrupted with an oxygen or sulphur atom to form an ether or thioether, respectively;

R_3 is hydrogen, C_{1-6} alkyl, or phenyl, or R_3 together with R_1 forms a $—(CH_2)_3—$ or $—(CH_2)_4—$, group; R_4 and R_5, which may be the same or different and may be attached to the same or different carbon atoms of the isoquinoline nucleus, are each hydrogen, halogen, hydroxy, C_{1-6} alkyl, phenyl, or R_4 together with R_5 form a $—(CH_2)_p—$ group, where p is an integer from 1 to 5 and one or more of the $—(CH_2)—$ moieties is optionally substituted by a C_{1-6} alkyl group; and

R_6 and R_{6a}, which may be the same or different, are each hydrogen, C_{1-6} alkyl, $—CH_2OR_{6b}$, halogen, hydroxy, C_{1-6} alkoxy, C_{1-6} alkoxycarbonyl, thiol, C_{1-6} alkylthio,

$—NHCOR_{6d}$, $—NHSO_2R_{6e}$, $—CH_2SO_2NR_6R_{6g}$, in which each of R_{6b} to R_{6g} is independently hydrogen, C_{1-6} alkyl, phenyl or phenylalkyl with the proviso that R_4, R_5, R_6 and R_{6a} are not simultaneously hydrogen.

10. A method of treating pain in mammals which comprises administering an effective, non toxic amount of a compound according to claim 1 to a sufferer.

4,954,510

ANTIVIRAL AGENT CONTAINING LACTAM COMPOUND

Takashi Tsuroka; Satoru Nakabayashi; Yuji Matsuhashi; Haruo Yamamoto; Shigeharu Inouye, and Shinichi Kondo, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

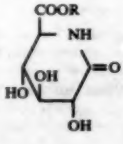
Filed Dec. 23, 1988, Ser. No. 289,152

Claims priority, application Japan, Dec. 25, 1987, 326747; Dec. 26, 1987, 328387

Int. Cl.[5] A61K *31/445*

U.S. Cl. 514—315 **6 Claims**

1. A method of treating viral infection which comprises administering to a host so infected an effective amount of D-glucaro-δ-lactam compound represented by formula (I')



(I')

wherein R represents a hydrogen atom or a straight-chain or

branched-chain alkyl group of 1 to 8 carbon atoms, or a pharmaceutically acceptable salt.

4,954,511

4-PENTAFLUOROPHENOXYPIPERIDINES

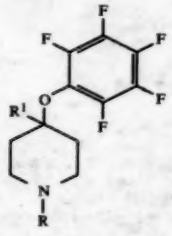
Grover C. Helsley, Pluckemin; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussell Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 167,941, Mar. 14, 1988, Pat. No. 4,914,204. This application Jan. 24, 1990, Ser. No. 456,720

Int. Cl.[5] A61K *31/445*; C02D *211/94*

U.S. Cl. 514—327 41 Claims

1. A compound of the formula



wherein R^1 is hydrogen or aryl; and R is a monovalent radical selected from the group consisting of hydrogen, cyano, loweralkyl, arylloweralkyl, bis-arylloweralkyl, aminoloweralkyl, (loweralkylamino)loweralkyl, (diloweralkylamino) loweralkyl, (diloweralkylphosphinyl) loweralkyl, the term aryl in each occurrence signifying a phenyl group optionally substituted by one or more substituents selected from the group consisting of halogen, loweralkyl, loweralkoxy and trifluoromethyl.

35. A method of treatment which comprises administering to a mammal in need of relief from convulsions a pharmaceutically effective amount of a compound as defined in claim 1.

37. A method of treatment which comprises administering to a mammal in need of relief from depression a pharmaceutically effective amount of a compound as defined in claim 1.

39. A method of treating a patient in need of relief from high blood pressure which comprises administering to the patient an effective amount of the compound as defined in claim 1.

41. A method of alleviating pain comprising administering to a mammal in need of pain alleviation a pain alleviating effective amount of a compound as defined in claim 1.

4,954,512

ANTI-ULCER COMPOSITION

Katsunori Oguro; Hiroshi Nojima; Nobuyuki Hashizume; Norio Ohno, and Taketoshi Naito, all of Tokyo, Japan, assignors to Shosuke Okamoto, Hyogo and Showa Denko Kabushiki Kaisha, Tokyo, both of, Japan

Filed Nov. 23, 1988, Ser. No. 275,193

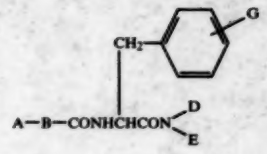
Claims priority, application Japan, Nov. 24, 1987, 62-297082

The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/44, 31/16, 31/24, 31/195*

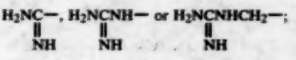
U.S. Cl. 514—352 9 Claims

1. An anti-peptic ulcer composition comprising, as an active ingredient, a therapeutically effective amount of a compound having the formula (I):

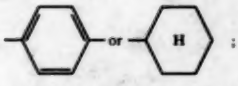


(I)

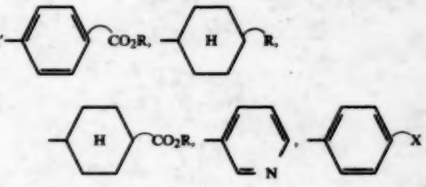
wherein A represents H_2NCH_2—,



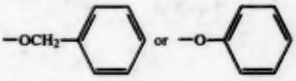
B represents



D and E each independently represent H, R, —R'CO_2R, —R'-(OH)CO_2R,



or D and E with the nitrogen to which they are bonded may form a piperidino ring which is substituted with a CO_2R wherein x represents H, $CONR_2$, CONHR, $CONH_2$, CO_2H, CO_2R, or COR; R' represents a lower alkylene group and R represents a lower alkyl group; G represents H,



or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,954,513

LEUKOTRIENE ANTAGONISTS

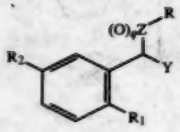
John G. Gleason, Downingtown; Ralph F. Hall, Villanova, and Joanne Smallheer, Landenberg, all of Pa., assignors to Smith-Kline Beecham Corporation, Philadelphia, Pa.

Filed Dec. 23, 1988, Ser. No. 288,827

Int. Cl.[5] A61K *31/18*; C07C *143/74, 143/80*

U.S. Cl. 514—381 14 Claims

1. A compound represented by the following structural formula (I):



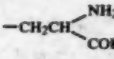
(I)

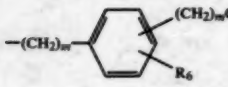
wherein:

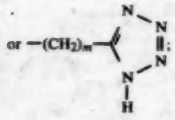
Z is S or O;

q is 0 when Z is O and q is 0, 1 or 2 when Z is S;

R is $-(CH_2)_m$ $CONHSO_2R_3$, $-(CH_2)_mCOOH$, $(CH_2)_mCO_2R_3$,







R_3 is alkyl, or aryl;

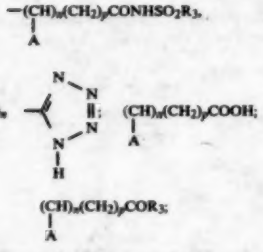
R_4 is OH, or Gly;

R_5 is OH, C_{1-6} alkoxy, or $NHSO_2R_3$;

R_6 is selected from H, CF_3, C_{1-4}alkyl, C_{1-4}alkoxy, F, Cl, Br, I, OH, NO_2, or NH_2;

m is 0–6;

Y is



A is H, OH, C_{1-4}alkyl, C_{1-4}alkoxy, OAc, or F;

n is 0 or 1; p is 0 or 1;

one of R_1 or R_2 is C_{8-13}alkyl, C_{7-12}alkoxy, phenyl C_{4-10}alkyl or phenyl C_{4-10}alkoxy and the other is H, Br, Cl, CH_3, CF_3, OH, NO_2 or C_{1-4}alkoxy;

provided that the $CONHSO_2R_3$ moiety must be present at one or more of the R or Y positions; or a pharmaceutically acceptable salt thereof.

4,954,514

(DI-TERT-BUTYLHYDROXYPHENYL)THIO DERIVATIVES AND ANTIARTERIOSCHLEROSIS COMPOSITIONS THEREOF

Toru Kita; Shuh Narumiya, Kyoto; Masayuki Narisada, Osaka; Fumihio Watanabe, Nara; Masami Dicteuchi, Owaka, and Takuji Mizui, Hygo all Of Japan, assignors to Shionogi & Co, Ltd, Owaka, Japan

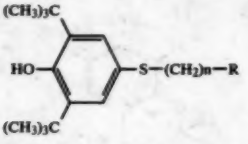
Filed Dec. 18, 1989, Ser. No. 451,743

Claims priority, application Japan, Jan. 25, 1989, 1-15387

Int. Cl.[5] C07D *257/04;* **A61K** *31/41, 31/05;* **C07C** *147/00*

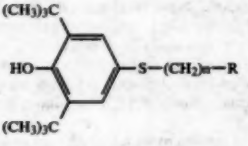
U.S. Cl. 514—381 **2 Claims**

1. A compound of the formula:



wherein R is cyano, carbamoyl, or 5-tetrazolyl; n is an integer of 2 to 6; provided that when R is cyano, n is not 2; or a pharmaceutically acceptable salt thereof.

2. A pharmaceutical composition for use in the treatment of arteriosclerosis of mammals comprising a pharmacologically effective amount of at least one compound of the formula:



wherein R is cyano, carbamoyl, or 5-tetrazolyl; n is an integer of 2 to 6; provided that when R is cyano, n is not 2, or a pharmaceutically acceptable salt thereof.

4,954,515

HALOALKYLAMINOMETHYL-2-NITRO-1-H-IMIDAZOLES

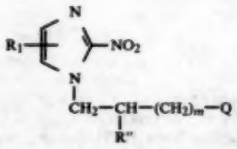
Mark J. Suto, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 25, 1988, Ser. No. 274,209

Int. Cl.[5] C07D *233/91*

U.S. Cl. 514—398 **9 Claims**

1. A compound of the formula (I)



I

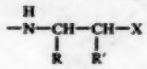
and a pharmacologically acceptable acid addition salt thereof; wherein m is 0 or 1;

R_1 is hydrogen or lower alkyl;

R" is (1) hydrogen or (2) OR_3 wherein R_3 is H or

wherein R_4 is lower alkyl, aryl wherein aryl is phenyl unsubstituted or substituted by one or two of lower alkyl,

halogen, trifluoromethyl, hydroxy, lower alkoxy, nitro, amino, monoalkyl, or dialkylamino, or aralkyl wherein aralkyl is aryl as defined above attached through an alkylenyl of from one to four straight or branched carbon chain; and Q is



wherein R and R' are independently hydrogen; lower alkyl, aryl as defined above, or aralkyl as defined above and X is halogen;

with the proviso that m is 0 or 1 when R'' is hydrogen; and m is 1 when R'' is OR_3.

4,954,516

USE OF 1-BENZYL-AMINOALKYL-PYRROLIDINONES AS ANTIDEPRESSANTS

Erich Lehr, Waldalgesheim; Wolf-Dietrich Bechtel, Appenheim; Karin Boke-Kuhn, Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen, and Karl-Heinz Weber, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

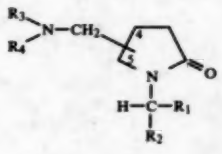
Continuation of Ser. No. 291,948, Dec. 28, 1988, abandoned, which is a division of Ser. No. 102,074, Sep. 29, 1987, Pat. No. 4,812,453. This application Jul. 20, 1989, Ser. No. 383,105

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634220

Int. Cl.[5] A61K *31/40*

U.S. Cl. 514—424 **4 Claims**

1. A method of treating depression which comprises administering, to a human host suffering from depression, an antidepressive amount of a compound of the formula I



(I)

wherein

R_1 represents hydrogen of a C_1–C_4 alkyl group,

R_2 represents a phenyl group which may be mono- or disubstituted by C_1–C_2 alkoxy, fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4 alkyl, hydroxy or nitro, or R_2 represents a pyridyl group,

R_3 represents hydrogen or a C_1–C_4 alkyl group and

R_4 represents hydrogen or a C_1–C_4 alkyl group,

or a pharmaceutically acceptable acid addition salt thereof.

4,954,517

MICROEICIDES

Marius Sutter, Basel, Switzerland; Bettina Böhlendorf, Braunschweig; Norbert Bedorf, Königslutter, and Gerhard Höfle, Braunschweig, all of Fed. Rep. of Germany, assignors to Gesellschaft für Biotechnologische Forschung mbH, Fed. Rep. of Germany and Ciba-Geigy Corporation, Ardsley, N.Y.

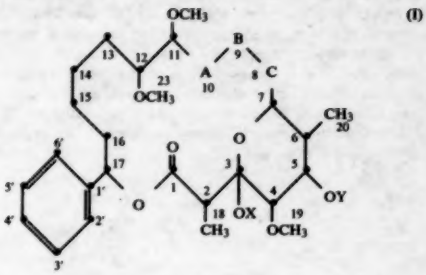
Filed Sep. 8, 1989, Ser. No. 405,382

Claims priority, application Switzerland, Sep. 9, 1988, 3377/88

Int. Cl.[5] A61K *31/365*; C01D *321/00*

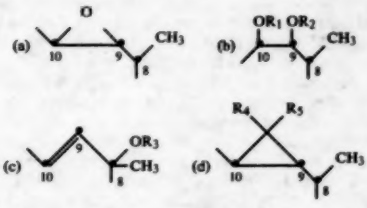
U.S. Cl. 514—450 **18 Claims**

1. A macrocyclic compound of the formula I



(I)

wherein said macrocyclic compound is in the 3-hemiacetal form of formula I or the opened 3-keto-7-hydroxyl form or a mixture of both forms and in which the substituents have the following meanings: X is hydrogen or methyl, Y is hydrogen, —CHO, $—COCH_3$, $—COCH_2OCH_3$, $—COCH_2NH_2$, benzyl, methyl or a silyl protecting group, and A—B—C is the following C_3-chain members:



in which R_1, R_2 and R_3, independently of one another, are hydrogen, methyl —CHO, $—COCH_3$, $—COCH_2OCH_3$, $—COCH_2NH_2$ or a silyl protecting group, and R_4 and R_5 are hydrogen, halogen or $–COO(C_1—C_3)$alkyl.

4,954,518

4H-1-BENZOPYRAN-4-ONE DERIVATIVE OR ITS SALT, PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME AS ACTIVE INGREDIENT

Shuntaro Takano, Toyama; Chosaku Yoshida, Tokuoka; Takihiro Inaba, Namerikawa; Keiichi Tanaka, Toyama; Ryuko Takeno, Toyama; Hideyoshi Nagaki, Toyama; Tomoya Shimotori, Toyama, and Shinji Makino, Kurobe, all of Japan, assignors to Toyama Chemical Company, Ltd., Tokyo, Japan

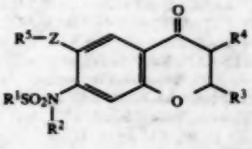
Filed Oct. 7, 1988, Ser. No. 255,121

Claims priority, application Japan, Oct. 8, 1987, 62-254251; May 17, 1988, 63-119990; Oct. 6, 1988, 63-250811

Int. Cl.[5] C07D *311/22*; A61K *31/35*

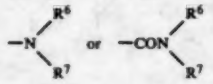
U.S. Cl. 514—456 **27 Claims**

1. A 4H-1-benzopyran-4-one derivative represented by the following formula or a pharmaceutically acceptable salt thereof:



wherein R^1 represents an unsubstituted or halogen-substituted lower alkyl, lower alkenyl or aryl group; R^2 represents a hydrogen atom or an alkyl or alkanoyl group; R^3 represents a

hydrogen or halogen atom, a cyano, azido, carboxyl, hydroxyl, formyl or alkoxycarbonyl group or a substituted or unsubstituted alkyl, alkoxy, phenoxy, cycloalkyl, carbamoyl, amino or phenyl group; R^4 represents a hydrogen or halogen atom, a nitro, cyano, carboxyl, alkanoyl, hydroxyl or alkoxycarbonyl group, a substituted or unsubstituted alkyl, alkoxy, alkylthio, phenylthio, lower alkynyl, lower alkenyl, sulfamoyl, alkylsulfinyl, alkylsulfonyl, amidino, phenyl or heterocyclic group or a group of the formula,



(R^6 is a hydrogen atom, a hydroxyl, cyano or alkoxycarbonyl group or a substituted or unsubstituted alkyl, cycloalkyl, phenyl, amino, alkanoyl, benzoyl, carbamoyl, alkylsulfonyl, imino-methyl or amidino group and R^7 is a hydrogen atom or a substituted or unsubstituted alkyl, alkoxy, phenyl, cycloalkyl or heterocyclic group, or R^6 and R^7, when taken together with the nitrogen atom to which the two are bonded, form a substituted or unsubstituted azetidin-1-yl, pyrrolidin-1-yl, piperidin-1-yl or pyrrol-1-yl group); R^5 represents a substituted or unsubstituted phenyl, thienyl, furyl or pyridyl group; Z represents an oxygen or sulfur atom or an imino group and the broken line means a single or double bond;

the alkyl, alkoxy, cycloalkyl, phenoxy, amino, carbamoyl and phenyl groups for R^3, the alkyl, alkoxy, alkylthio, phenylthio, amidino, lower alkenyl, lower alkylnyl, sulfamoyl, alkylsulfinyl, alkylsulfonyl, phenyl and heterocyclic groups for R^4, the alkyl, cycloalkyl, phenyl, amino, alkanoyl, benzoyl, carbamoyl, alkylsulfonyl, iminomethyl and amidino groups for R^6, the alkyl, alkoxy, cycloalkyl, phenyl and heterocyclic groups for R^7, the azetidin-1-yl, pyrrolidin-1-yl, piperidin-1-yl or pyrrol-1-yl group which R^6 and R^7 form with the nitrogen atom to which the two are bonded and the phenyl, thienyl, furyl and pyridyl groups for R^5 may each be substituted by at least one substituent selected from the group consisting of halogen atoms and alkoxy, alkylthio, phenoxy, carboxyl, alkanoyl, alkoxycarbonyl, carbamoyl, sulfamoyl, cyano, alkylsulfonyl, hydroxyl, mercapto, alkanoylamino, alkylamino, dialkylamino, alkyl, cycloalkyl, oxo, nitro, haloalkyl, amino, phenyl, alkoxy-carbonylamino, hydroxyimino and heterocyclic groups; and the term "heterocyclic group" mentioned for R^4, R^7 and above substituent represents thienyl, furyl, pyrrolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, imidazolyl, benzimidazolyl, benzthiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,3,4-thiadiazolyl, 1,3,4-oxadiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, pyridyl, quinolyl, isoquinolyl, pyrimidinyl, piperazinyl, pyrazinyl, pyridazinyl, 1,2,3,4-tetrahydroquinoyl, 1,2,4-triazinyl, imidazo[1,2-b][1,2,4]triazinyl, pyrrolidinyl, morpholinyl or quinuclidinyl group.

4,954,519

ISOCOUMARINS WITH BASIC SUBSTITUENTS AS SERINE PROTEASES INHIBITORS, ANTICOAGULANTS AND ANTI-INFLAMMATORY AGENTS

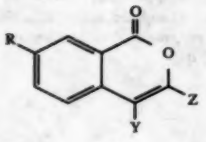
James C. Powers, Atlanta; Chih-Min Kam, Roswell; Steven W. Oweida, and David N. Ku, both of Decatur, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 43,647, Apr. 28, 1987, Pat. No. 4,845,242. This application Jul. 3, 1989, Ser. No. 374,980

Int. Cl.[5] A61K *31/40*

U.S. Cl. 514—456 **9 Claims**

1. A method of inhibiting blood clotting of mammalian blood comprising contacting said blood with a therapeutically amount of a compound having the following structure:



or a pharmaceutically acceptable salt thereof, wherein

R is selected from the group consisting of —N-H—C(=NH)NH_2, —C(=NH)NH_2, amino-C_{1-6} alkyl, and isothiureido-C_{1-6} alkyl,

Z is selected from the group consisting of H, halogen, C_{1-6} alkyl, C_{1-6} alkyl with a phenyl group attached to the alkyl group, C_{1-6} fluorinated alkyl, C_{1-6} alkyl with a hydroxyl group attached to the alkyl group, C_{1-6} alkyl with a C_{1-6} alkoxy group attached to the alkyl group, C_{1-6} alkoxy, C_{1-6} fluorinated alkoxy, C_{1-6} alkoxy with a phenyl group attached to the alkoxy group, benzyloxy group wherein the phenyl group is unsubstituted or substituted by one or two substituents selected from halogen, trifluoromethyl, NO_2, cyano, methyl, methoxy, acetyl, carboxyl, OH, and amino, and

Y is selected from the group consisting of H, halogen, trifluoromethyl, methyl, OH, and methoxy.

4,954,520

1,3-DIOXOLANE DERIVATIVES USEFUL IN THE TREATMENT OF INFLAMMATION

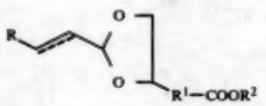
Stevan W. Djuric, Glenview, and Thomas D. Penning, Des Plaines, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 19, 1989, Ser. No. 299,366

Int. Cl.[5] A61K *31/335*; C07D *317/26*

U.S. Cl. 514—467 **30 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein R is alkyl of 5 to 14 carbon atoms, alkenyl of 5 to 14 carbon atoms or alkynyl of 5 to 14 carbon atoms; R^1 is lower alkylene or phenylene; and R^2 is hydrogen or lower alkyl.

4,954,521

METHODS FOR ADMINISTERING ANTI-THROMBOTIC COMPOUNDS

Philip N. Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209, and Leon D. Freeman, 101 Casabuena Dr., Corte Madera, Calif. 94925

Division of Ser. No. 817,178, Jan. 9, 1986, Pat. No. 4,727,164, which is a continuation of Ser. No. 317,763, Nov. 3, 1981, abandoned, which is a division of Ser. No. 117,066, Jan. 31, 1980, Pat. No. 4,329,290, which is a continuation-in-part of Ser. No. 35,637, May 3, 1979, abandoned, which is a continuation of Ser. No. 701,874, Jul. 1, 1976, Pat. No. 4,164,585. This application Dec. 2, 1987, Ser. No. 108,258

Int. Cl.[5] A61K *31/34*

U.S. Cl. 514—474 **9 Claims**

1. A method for reducing thrombotic tendencies in a host which comprises administering to the host a therapeutically effective amount of a mixture of esters of para amino benzoic acid and ascorbic acid to reduce thrombotic tendencies therein.

4,954,522
LYOPHILIZED PREPARATION OF PLATINUM COMPOUND

Shintaro Suzuki; Noriaki Yanagisawa, and Taka'aki Ohkuma, all of Tokyo, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 275,008
Claims priority, application Japan, Dec. 3, 1987, 62-304509
Int. Cl.[5] A61K *31/28*
U.S. Cl. 514—492 3 Claims

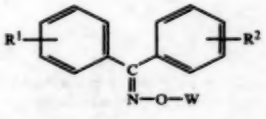
1. A lyophilized preparation comprising dextrane having a molecular weight of 40,000 to 150,000 and cis-1,1-cyclobutanedicarboxylate(2R)-2-methyl-1,4-butanediamine platinum (II), and the amount of dextrane being from about 0.2 part to about 5 parts per part by weight of the platinum compound, wherein said preparation is easily redissolved in a period of time within a range substantially less than 5 minutes and extending down to a period of time as short as 10–15 seconds.

4,954,523
BENZOPHENONE OXIME ETHER COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND TREATMENT METHODS

Youji Yamagishi, Kamiinayoshi; Kozo Akasaka; Takeshi Suzuki, both of Ushiku; Mitsuaki Miyamoto, Ibaraki; Kouji Nakamoto, Tsuchiura; Kazuo Okano, Yatabemachi; Shinya Abe; Hironori Ikuta, both of Ushiku; Kenji Hayashi; Hiroyuki Yoshimura, both of Yatabemachi; Tohru Fujimori, Toyosato; Koukichi Harada, Yatabemachi, and Isao Yamatsu, Ushiku, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

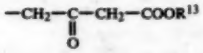
Division of Ser. No. 24,737, Mar. 11, 1987, Pat. No. 4,886,834. This application Jun. 9, 1989, Ser. No. 364,712
Claims priority, application Japan, Mar. 17, 1986, 61-57061; Mar. 26, 1986, 61-65963
Int. Cl.[5] A61K *31/15, 31/44, 31/385, 31/40, 31/415;* C07C *251/56, 251/50, 213/56*
U.S. Cl. 514—521 19 Claims

1. A substituted benzophenone oxime ether derivative having the formula



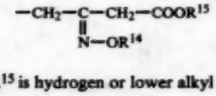
wherein each of R^1 and R^2 is hydrogen, hydroxyl or lower alkoxy; W is

(1)



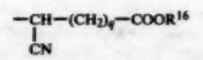
in which R^{13} is hydrogen or lower alkyl,

(2)



in which R^{15} is hydrogen or lower alkyl and R^{14} is lower alkyl,

(3)



in which R^{16} is hydrogen or lower alkyl and q is an integer of 1, 2 or 3, or,

(4) $-(CH_2)_p-Z$ in which —Z is —SH or —SCN, and p is an integer of 1 or 2, or pharmacologically acceptable salt thereof.

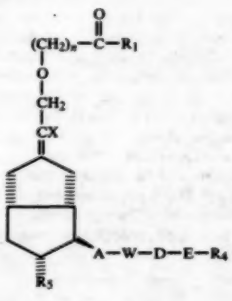
18. A pharmaceutical composition which comprises a pharmacologically effective amount of the substituted benzophenone oxime ether derivative as defined in claim 1 or a pharmacologically acceptable salt thereof and a pharmacologically acceptable carrier.

4,954,524
CARBACYLCINS, THEIR PREPARATION AND USE AS MEDICINAL AGENTS

Werner Skuballa; Bernd Radüchel; Helmut Vorbrueggen, all of Berlin; Jorge Casals-Stenzel, Mainz; Gerda Mannesmann, Cologne; Ekkehard Schillinger, and Michael H. Town, both of Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 188,944, May 2, 1988, abandoned, which is a continuation of Ser. No. 77,279, Jul. 24, 1987, abandoned, which is a continuation of Ser. No. 859,977, May 5, 1986, abandoned, which is a continuation of Ser. No. 510,121, Jul. 1, 1983, abandoned. This application Apr. 6, 1989, Ser. No. 333,812
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1982, 3225287
Int. Cl.[5] C07C *177/00;* H61K *31/557*
U.S. Cl. 514—530 46 Claims

1. A carbacyclin of the formula

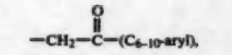


wherein

R_1 is hydrogen or OR_2,

wherein

R_2 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; hydroxy; C_{1-4} alkoxy; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups as a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms, or (i)



wherein the aryl group is unsubstituted or substituted by (A) (1–3 phenyl groups, each of which is unsubstituted or

substituted by 1–3 halogen atoms; (B) 1–3 —C_{1-4}-alkoxy groups; or (C) 1–3 halogen atoms;

or R_1 is NHR_3, wherein R_3 is R_2 or the acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;

W is —CHOR—, or

wherein the OR-group is in the α- or β-position;

R is H, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;

n is 3, 4, or 5;

X is hydrogen,

A is $—CH_2—CH_2—$, trans—CH=CH—, or —C≡C—,

C_{1-10}-alkylene, or C_{2-10}-alkenylene, each of which is optionally substituted by fluorine;

m is 1, 2, or 3;

E is —C≡C—, or $—CR_6=CR_7—$, wherein R_6 is H, C_{1-5} alkyl and R_7 is H, halo or C_{1-5} alkyl;

R_5 is OR;

R_4 is (a) a C_{1-10} hydrocarbon aliphatic radical, (b) a C_{1-10} hydrocarbon aliphatic radical substituted by C_{6-10} aryl or by C_{6-10} aryl substituted by 1–3 halogen atoms; a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; (c) C_{3-10} cycloalkyl, (d) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-10} aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms;

or when R_1 is H, a physiologically compatible salt thereof with a base.

4,954,525

METHOD OF TREATING SKIN DISEASES

Isao Yamatsu, Saitama; Yuichi Inai; Shinya Abe, both of Tokyo; Takeshi Suzuki, Abiko; Yoshikazu Suzuki, Ichinomiya; Osamu Tagaya, Gifu; Kouichi Suzuki, Kakamigahara; Kouichi Abe, Fuchu, and Kouji Yamada, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,870

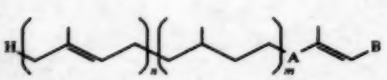
Claims priority, application Japan, Dec. 24, 1980, 55-182116

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.[5] A01N *37/02*; C07C *57/03*

U.S. Cl. 514—549 **10 Claims**

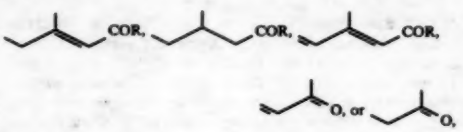
1. A method for treating skin diseases with keratinization and allergic or inflammatory skin diseases which comprises administering a polyprenyl compound having the formula (I):



(I)

in which each of n and m is 0, 1 or 2, n+m is 0, 1 or 2, A is

and B is



or

wherein R is hydroxy, lower alkoxy, or

in which each of R_1 and R_2 is hydrogen, lower alkyl or aryl; with the proviso that R is lower alkoxy or

when n is 1, m is 0, A is

and B is

to a patient orally or parenterally in the dosage ranging from 40 mg to 4 g/day for an adult human being.

4,954,526

STABILIZED NITRIC OXIDE - PRIMARY AMINE COMPLEXES USEFUL AS CARDIOVASCULAR AGENTS

Larry K. Keefer, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 28, 1989, Ser. No. 316,958

Int. Cl.[5] A61K *31/13, 31/20, 31/195, 31/655*

U.S. Cl. 514—611 **20 Claims**

1. A method of treating hypertension, wherein said method comprises administering to a mammal, in need thereof, a therapeutically effective amount of a compound of the formula:

$$[R—N(H)N(NO)O—]_nX$$

wherein:

R is C_{3-6} lower alkyl, phenyl, benzyl, or C_{3-6} cycoloalkyl, any of which R groups may be substituted by one to three substituents, same or different, selected from the group consisting of halo, hydroxy, C_{1-6} alkoxy, $—NH_2$, $—C(O)NH_2$, —CH(O), —C(O)OH and $—NO_2$:

X is a pharmaceutically acceptable cation,

a pharmaceutically acceptable metal center, or

a pharmaceutically acceptable organic group selected

from the group consisting of C_{1-8} lower alkyl, —C-(O)CH_3 and —C(O)NH_2; and

Y is one to three, consistent with the valence of X.

4,954,527

NOVEL POLYACETYLENE COMPOSITIONS AND THEIR METHODS OF USE

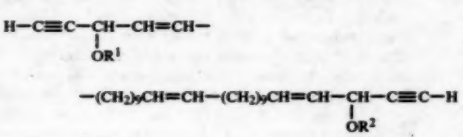
Amy E. Wright, Ft. Pierce; Winnie C. Thompson, and May S. Lui, both of Vero Beach, all of Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.

Continuation of Ser. No. 879,071, Jun. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 825,060, Jan. 31, 1986, abandoned. This application Dec. 7, 1987, Ser. No. 131,233

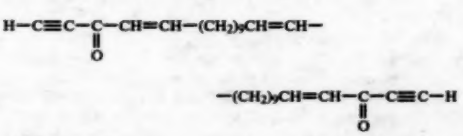
Int. Cl.[5] C07C *33/044*; A61K *31/045, 31/12, 31/22*

U.S. Cl. 514—675 **6 Claims**

1. A substantially pure compound of the formulae:



or



wherein R^1 and R^2 are the same or different and are selected from the group consisting of lower acyl and hydrogen.

4,954,528

HYPOCHOLESTEROLEMIC USE OF BIS(3,5-DI-TERTIARY-BUTLY-4-HYDROXYPHENYL-THIO)METHANE

Simon J. T. Mao, Loveland, and Richard L. Jackson, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 281,433, Dec. 8, 1988, Pat. No. 4,900,757. This application Nov. 15, 1989, Ser. No. 433,985

The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.

Int. Cl.[5] A61K *31/10*

U.S. Cl. 514—712 **2 Claims**

1. A method of lowering total serum cholesterol in a patient in need thereof comprising administering to said patient a therapeutically effective hypocholesterolemic amount of bis(3,5-di-tertiary-butyl-4-hydroxyphenylthio) methane.

4,954,529

(THIO)BENZOYLUREAS AND FUNCTIONAL DERIVATIVES THEREOF, PROCESSES FOR THEIR PREPARATION, AGENTS CONTAINING THEM AND THEIR USE AS AGENTS FOR COMBATING PESTS

Volker Koch, Kelkheim; Stefan Schnatterer, Frankfurt am Main; Werner Bonin, Kelkheim; Manfred Kern, Lörzweiler; Werner Knauf, Eppstein/Taunus, and Anna Waltersdorfer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

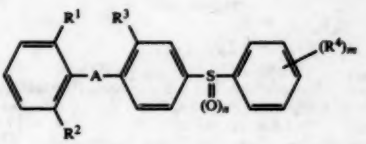
Filed Dec. 2, 1988, Ser. No. 278,966

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741062

Int. Cl.[5] A01N *47/30*; C07C *275/02, 275/54*

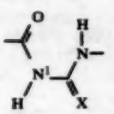
U.S. Cl. 514—594 **11 Claims**

1. A compound of formula I



(I)

in which A is the radical A^1



(A^1)

R^1 to R^3 in each case independently of one another are hydrogen or halogen,

the radicals R^4 in each case independently of one another are halogen, (C_1–C_3) halogenoalkyl or nitro,

X is oxygen

n is 0 and

m is a number from 1 to 4

or, an agriculturally suitable salt thereof, provided that $(R^4)_m$ is not by itself halogen or is not by itself nitro.

10. An acaridical or insecticidal agent which comprises an effective amount of a compound of formula I as claimed in claim 1 and a suitable carrier therefor.

4,954,530

PREVENTING AGENT FOR HUMAN IMMUNODEFICIENCY VIRUS INFECTION COMPRISING MENFEGOL

Tsutomu Miyamoto; Hisanaga Igarashi, both of Nagasaki, and Sugiyama Hidenori, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,367

Claims priority, application Japan, May 25, 1988, 63-125661

Int. Cl.[5] A61K *31/075, 31/74*

U.S. Cl. 514—718 **4 Claims**

1. A method for the prevention of human immunodeficiency virus infection which comprises causing male semen of an infected male at the time of ejaculation to come into contact with a preparation which comprises menfegol as an active ingredient in an amount ranging from 10 to 100 mg per dose and a pharmaceutically acceptable carrier therefor.

4,954,531

USE OF 2,5-ANHYDRO-D-MANNITOL AS A FOOD INTAKE MODIFIER

Mark I. Friedman, Merion; Michael G. Tordoff; Michael J. DiNovi, both of Philadelphia, and Robert J. Rafka, Ardmore, all of Pa., assignors to Monell Chemical Senses Center, Philadelphia, Pa.

Division of Ser. No. 910,698, Sep. 23, 1986, Pat. No. 4,808,626. This application Aug. 15, 1988, Ser. No. 231,941

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/045*

U.S. Cl. 514—738 **6 Claims**

1. A method of altering the food intake of mammal, comprising administering 2,5-anhydro-D-mannitol to said mammal in an amount and at a time effective to alter the food intake of said mammal.

4,954,532

COSMETIC FORMULATON

Thomas J. Elliott, London, and Susan Dutton, Northolt, both of England, assignors to Beecham Group p.l.c., England

Filed Jan. 30, 1985, Ser. No. 696,269

Claims priority, application United Kingdom, Feb. 1, 1984, 8402637

Int. Cl.[5] A61K *7/075, 7/48, 47/00*

U.S. Cl. 514—846 **5 Claims**

1. A degreasing or moisturizing composition, comprising from 0.1 to 5% by weight of a silanized silica gel, from 2.5 to 15% by weight of a humectant moisturizing agent, and an inert carrier or diluent therefor.

4,954,533

LOW VISCOSITY SILICONE FOAM COMPOSITIONS

Frank J. Modic, Scotia, and Richard A. Striker, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 225,903, Jul. 29, 1988, Pat. No. 4,871,782. This application Jul. 18, 1989, Ser. No. 381,426

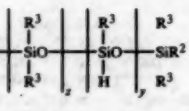
Int. Cl.[5] C08J *9/02, 9/04*

U.S. Cl. 521—82 **2 Claims**

1. A foamable composition in packages comprising, a first package comprising:

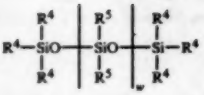
(a) from 0 to 100 parts by weight vinyl-containing polysiloxane comprising:

(i) vinyl endcapped polysiloxane composition having a viscosity between about 10,000 and 1,000,000 centipoise at 25° C. and containing vinyl endcapped polysiloxane having the formula:



where R is vinyl and R^1 is selected from substituted or unsubstituted hydrocarbon radicals of from 1 to 20 carbon atoms, such that the polymer contains from 0.0002 to 3% by weight vinyl and x varies such that the viscosity of said vinyl endcapped polysiloxane varies from 100 to 1,000,000 centipoise at 25° C., and

(ii) in an amount of from 1/9 to 9/1 by weight to said vinyl endcapped polysiloxane composition a low viscosity vinyl-containing polysiloxane composition comprising low viscosity vinyl-containing polysiloxane having the formula



where R^4 and R^5 are selected from substituted or unsubstituted hydrocarbon radicals of from 1 to 20 carbon atoms, at most, one R^4 is vinyl, the polymer contains 0.0002 to 1% by weight vinyl, and w varies such that the viscosity of said low viscosity vinyl-containing polysiloxane varies from 50 to about 2,000 centipoise at 25° C.; and

(b) from 1 to 50 parts by weight of a hydride polysiloxane of the formula:

where R^2 is selected from the group consisting of independently, hydrogen, alkyl radicals of from 1 to 8 carbon atoms, aryl radicals of from 1 to 8 carbon atoms, haloalkyl radicals of 3 to 8 carbon atoms and simultaneously, a single —O— to form a cyclic polymer and R^3 is selected from the group consisting of alkyl radicals of from 1 to 8 carbon atoms, aryl radicals of from 1 to 8 carbon atoms, and fluoroalkyl radicals of 3 to 8 carbon atoms, where the hydride polysiloxane has a hydrogen content varying from 0.3 to 1.6% by weight and z and y vary such that the polymer has a viscosity varying from 1 to 500 centipoise at 25° C.;

a second package comprising:

(a) from 0 to 100 parts by weight said vinyl-containing polysiloxane, of (i and ii) of component (a); and

(c) a hydroxyl source selected from the group consisting of water, organic alcohol, hydroxylated siloxane, and combinations thereof in an amount to provide a molar ratio of from about 0.02/1 to about 5/1 of hydroxyl radicals to silicon-bonded hydrogen atoms of component (b); and

a third package comprising:

(a) from 0 to 100 parts by weight said vinyl-containing polysiloxane, of (i and ii) of component (a);

wherein the sum total of said vinyl-containing polysiloxane, of (i and ii) of component (a), is 100 parts and there is mixed with said vinyl-containing polysiloxane in either the second or third packages or both

(d) from about 1 to about 250 parts per million based on said foamable composition of platinum catalyst.

4,954,534

PHOTODECOMPOSING ORGANOSILICON COMPOUNDS AND PHOTOPOLYMERIZABLE EPOXY RESIN COMPOSITIONS CONTAINING THE ORGANOSILICON COMPOUNDS

Tetsu Yamamuro, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

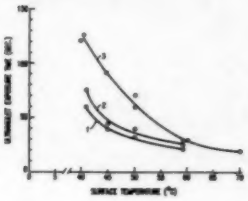
Filed Jul. 15, 1988, Ser. No. 219,193

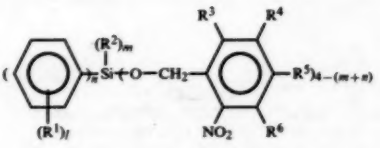
Claims priority, application Japan, Jul. 23, 1987, 62-185061; Jul. 23, 1987, 62-185062

Int. Cl.[5] C08G *59/70*; C07F *7/10*

U.S. Cl. 522—28 **9 Claims**

4. A photopolymerizable epoxy resin composition prepared by mixing an epoxy resin component, an photodecomposing organosilicon compound having general formula (I), and an aluminum compound:





(I)

wherein R^1 represents fluorine; l is an integer of 1 to 5; R^2 represents a lower alkyl group, a lower unsaturated alkyl group or an aromatic group, R^3, R^4, R^5 and R^6 each represent hydrogen, halogen, an alkyl group, an aryl group, a nitro group, a cyano group, and an alkoxyl group, which may be the same or different; m is an integer of 0 to 2, when m is 2, each R^2 may be the same or different; and n is an integer of 1 to 3, provided that $m+n$ is not more than 3 ($m+n \leqq 3$).

4,954,535

HIGH-DURABILITY PLATE BRICK FOR SLIDING GATE NOZZLE APPARATUS

Tsutomu Harada, and Hiroshi Shikano, both of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Filed Sep. 30, 1988, Ser. No. 252,084

Claims priority, application Japan, Oct. 15, 1987, 62-261336

Int. Cl.[5] C08K *3/08*

U.S. Cl. 523—139 **7 Claims**

1. A method of producing a high-durability plate brick for a sliding gate nozzle apparatus comprising mixing a refractory aggregate composition containing a metal having a melting point of not higher than 1000° C., a thermosetting resin exhibiting a higher mechanical strength when heated to about 150° to 250° C., and 10 to 90 wt % based on the amount of thermosetting resin of a silicon resin, the thermosetting resin and silicon resin being present in an amount of 2 to 15 wt % based on the amount of refractory aggregate composition, and heating the mixture to form said plate brick.

4,954,536

BRAKE-FRICTION MATERIAL

Teruyuki Komori; Shingo Miyake, both of Yokohama, and Yoshio Senoo, Komae, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Apr. 19, 1989, Ser. No. 340,440

Claims priority, application Japan, Apr. 20, 1988, 63-97410; May 20, 1988, 63-123368

Int. Cl.[5] C08K *7/04, 3/30, 3/08, 3/04*

U.S. Cl. 523—149 **11 Claims**

1. A brake-friction material comprising:

(a) a base material having a fiber structure for giving high mechanical strength and high friction coefficient to the brake-friction material;

(b) a lubricant for decreasing wear of the brake-friction material;

(c) a filler for giving heat stability to the brake-friction material and helping friction characteristic of the brake-friction material; and

(d) a bonding material composed of condensed polynuclear aromatic hydrocarbon resin.

4,954,537

INTERNAL MOLD RELEASE AGENT FOR USE IN POLYUREA RIM SYSTEMS

Frank Sanns, Jr., Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jun. 8, 1989, Ser. No. 362,906

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—157 **22 Claims**

1. A process for the production of an optionally cellular, polyurea elastomer molding which comprises reacting a reaction mixture containing

(I) a polyisocyanate,

(II) a polyether having at least two isocyanate-reactive groups and a molecular weight of 1800 to 12,000 in which at least 50% of the isocyanate-reactive groups are primary and/or secondary amino groups,

(III) about 5 to 50% by weight, based on the weight of component (II), of a chain extender comprising a sterically hindered aromatic diamine and

(IV) about 1 to 20% by weight, based on the weight of components (II) and (III), of an active hydrogen-containing fatty acid ester having a molecular weight of about 500 to 5000 and prepared by reacting an alcohol with an aliphatic, saturated or unsaturated fatty acid, said ester being characterized in that at least one aliphatic acid which contains more than 8 carbon atoms is built into the molecule, said ester further characterized as having an acid number of 0 to 100 and a hydroxyl number of 0 to 150 with at least one of said numbers being greater than 0,

wherein said fatty acid ester is initially blended with component (II), component (III) or a mixture thereof and the reaction mixture is processed as a one-shot system by the RIM process at an isocyanate index of about 70 to 130.

4,954,538

MICRO-EMULSIFIED GLYOXALATED ACRYLAMIDE POLYMERS

David L. Dauplaise, Norwalk; Joseph J. Kozakiewicz, Trumbull, and Joseph M. Schmitt, Ridgefield, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 19, 1988, Ser. No. 286,091

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.[5] C08K *7/16*; D21H *17/00*

U.S. Cl. 523—223 **9 Claims**

1. A composition comprising microparticles of a glyoxylated (meth)acrylamide-containing polymeric material having (1) sufficient glyoxal-reactive amide substituents and —CHOH-CHO substituents to continually self cross-link said material at ambient conditions, said —CHOHCHO substituents being present in a excess of about 0.5 weight percent and (2) diameters ranging from about 200 to about 3000 Å.

4,954,539

AQUEOUS SILICONE EMULSIONS CONTAINING TIN MONOCHELATE CROSSLINKING CATALYSTS

Jacques Cavezzan, Villeurbanne, and Michel Peignier, L'Arbresle, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 23, 1989, Ser. No. 370,782

Claims priority, application France, Jun. 23, 1988, 88 08702

Int. Cl.[5] C08L *5/00*

U.S. Cl. 524—27 **8 Claims**

1. A crosslinkable aqueous silicone emulsion, comprising, emulsified in water, (a) an α,ω-dihydroxydiorganopolysiloxane, (b) an organohydropolysiloxane containing at least 3

hydrogen atoms bonded to silicon atoms per molecule, (c) a polyvinyl alcohol, (d) a nonionic emulsifying agent, and (e) a crosslinking catalytically effective amount of a monochelate of pentacoordinated tin of valency IV.

4,954,540

HALOGEN-CONTAINED POLYESTER RESIN COMPOSITE AND ELECTRIC WIRE

Toshio Nakane, Fuji; Kenji Hijikata, Mishima; Yukihiko Kageyama, Fujinomiya, and Michiro Naka, Fuji, all of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Mar. 3, 1988, Ser. No. 164,225

Claims priority, application Japan, Apr. 13, 1987, 62-90599

Int. Cl.[5] C08K *5/34*

U.S. Cl. 524—86 **15 Claims**

1. A halogen-containing polyester resin composition comprising bisaziridine compounds and a flame-resisting aromatic polyester copolymer containing a halogen in an amount of 0.5 to 30% by weight, said polyester copolymer obtained by polycondensating

(A) mainly aromatic dicarboxylic acids or ester-forming derivatives thereof;

(B) mainly aliphatic glycols or ester-forming derivatives thereof; and

(C) halogen-containing ester-forming compounds, said bisaziridine compounds being present in an amount of 0.1 to 10% by weight based on the total quantity of the composite.

4,954,541

FLAME-RETARDANT RESIN COMPOSITION AND ELECTRIC WIRE

Toshio Nakane; Yukihiko Kageyama; Hiroaki Konuma, and Kenji Hijikata, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

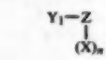
Filed Nov. 15, 1988, Ser. No. 271,323

Claims priority, application Japan, Dec. 9, 1987, 62-311547

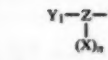
Int. Cl.[5] C08K *5/35, 5/34*

U.S. Cl. 524—86 **13 Claims**

1. A flame-retardant resin composition consisting of essentially of (A) an aromatic polyester prepared by condensation polymerization between (a) a component substantially comprising an aromatic dicarboxylic acid or an ester-forming derivative thereof and (b) a component substantially comprising an aliphatic glycol or an ester-forming derivative thereof, (B) 0.1 to 30% by weight based on the total amount of the composition of a halogenated containing compound represented by the general formula (1) or (2) and (C) 0.1 to 30% by weight based on the total amount of the composition of a compound represented by the general formula (3):

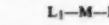


(1)



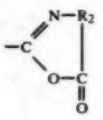
(2)

wherein X stands for a halogen atom; Y_1 and Y_2 are each a member selected from the group consisting of hydroxyl, carboxyl, glycidyl ester and glycidyl ether; Z is a monovalent or divalent organic group and n is an integer of 1 or more and

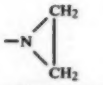


(3)

wherein L_1 and L_2 may be the same or different and are each a 3- to 8-membered cyclic reactive group selected from among those represented by the general formulae (5) and (6):



(5)



(6)

R_2 is a divalent organic group wherein a hydrogen atom directly bonded to the ring may be substituted with an alkyl and/or aryl group and M is a divalent organic group.

4,954,542

TETRAHALOPHTHALATE ESTERS AS FLAME RETARDANTS FOR POLYBUTYLENE TEREPHTHALATE RESINS (PBT)

Joseph M. Bohen, King of Prussia, and Ronald F. Lovenguth, Doylestown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

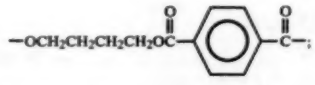
Filed Mar. 25, 1988, Ser. No. 173,343

Int. Cl.[5] C08K *5/12*

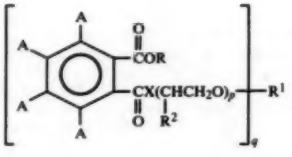
U.S. Cl. 524—89 **18 Claims**

1. A uniform flame retardant molding composition comprising:

(i) a polybutlyene terephthalate resin having the following repeated structural units:

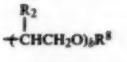


(ii) a flame retarding effective amount of a tetrahalophthalate ester flame retardant processing aid of the formula:



wherein

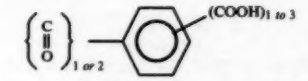
(a) R is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 30 carbons, and

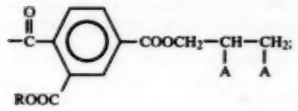


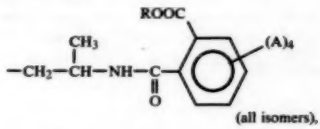
where R^8 is an alkyl or substituted alkyl of 1 to 18 carbons, and b is 1 to 50;

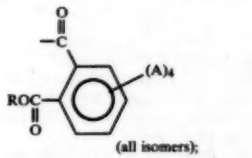
(b) R^1 is selected from the group consisting of an alkyl or substituted alkyl of 1 to 30 carbons, alkenyl or substituted alkenyl of 2 to 22 carbons,

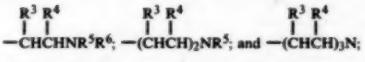
where R^7 is an alkyl of 1 to 18 carbons;











with the proviso that the valence of R^1 is equal to q;

(c) R^2 is independently selected from the group consisting of H and CH_3;

(d) R^3, R^4, R^5, and R^6 are independently selected from the group consisting of H and an alkyl of 1 to 18 carbons;

(e) p is an integer of 0 to 50;

(f) q is an integer of 1 to 6;

(g) X is selected from the group consisting of 0 or NH;

(h) A is selected from the group consisting of Cl or Br; and

(i) provided further that when p is zero and X is oxygen that R and R^1 are other than a neopentyl group.

4,954,543

COATING FOR INCREASING SENSITIVITY OF A RADIATION IMAGEABLE POLYACETYLENIC FILM

David F. Lewis, Monroe, Conn., and Robert D. Schenfele, Caldwell, N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Oct. 17, 1988, Ser. No. 258,522
Int. Cl.[5] C08F *222/06*
U.S. Cl. 524—104 **12 Claims**

1. A dispersion composition comprising between about 0.001% and about 1.0% by weight of an N-C_{10-22} alkyl lactam dispersing aid, a metal nitrate, acetate or persulfate salt of a metal having an atomic number of at least 50 or a mixture of said lactams or metal salts dispersed in between about 4% and about 50% by weight of an aqueous solution of a binder compatible with the binder of imageable polyacetylene crystals; said composition having a weight ratio of metal salt to binder between about 0.4:1 and about 2.5:1.

4,954,544

MODIFIED ADHESIVE COMPOSITION WHICH UNDERGOES COLOR CHANGES UPON APPLICATION

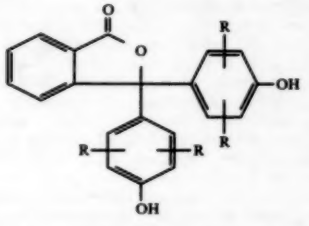
Ashok K. Chandaria, Ontario, Canada, assignor to Conros Corporation, Ontario, Canada

Filed Mar. 3, 1989, Ser. No. 319,112
Int. Cl.[5] C08K *5/15*
U.S. Cl. 524—111 **11 Claims**

1. An adhesive composition, which upon application to a substrate, undergoes a change from colored to colorless, said composition comprised of:

(a) polyvinylpyrrolidone in an aqueous organic medium with a soap forming gelling agent,

(b) a colored indicator additive which upon exposure to air becomes colorless, and which has the formula:



wherein each R individually represents hydrogen or lower alkyl,

(c) a carbamide, and

(d) a non-ionic surfactant.

4,954,545

PROCESS FOR CLEANING POLYMER PROCESSING EQUIPMENT

Fay W. Bailey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 78,338, Jul. 27, 1987, Pat. No. 4,838,948. This application Dec. 12, 1988, Ser. No. 283,350
Int. Cl.[5] C08K *3/26, 3/32, 3/34;* C11D *1/12*
U.S. Cl. 524—158 **12 Claims**

1. A polymeric composition consisting essentially of:

(a) from 92 to 97.4 weight percent of a polymer wherein said polymer is selected from the group consisting of homopolymers of α-olefins, copolymers of α-olefins, homopolymers of conjugated dienes, homopolymers of monovinyl arenes, copolymers of conjugated dienes and monovinyl arenes, homopolymers of polyamides, copolymers of polyamides, homopolymers of polyphenylene sulfide, copolymers of polyphenylene sulfide, fluoroplastics and acrylic resins;

(b) from 2.4 to 6.4 weight percent of a mild abrasive, wherein said mild abrasive is selected from the group consisting of calcium carbonate, calcium phosphate, calcium silicate and aluminum silicate and;

(c) from 0.2 to 1.6 weight percent of a sulfonated surfactant wherein said sulfonated surfactant is selected from the group consisting of

(1) alkyl sulfonates of the formula $RSO_3^-M^+$, wherein R is selected from the group consisting of alkyl groups containing from 8 to 20 carbon atoms and M is selected from the group consisting of sodium, calcium and lithium;

(2) alkyl benzyl sulfonates of the formula $RC_6H_4SO_3^-M^+$, wherein R is selected from the group consisting of alkyl groups containing from 8 to 20 carbon atoms and M is selected from the group consisting of sodium, calcium and lithium; and

(3) α-olefin-sulfonates of the formula $RCH{=}CHSO_3^-M^+$, wherein R is selected from the

group consisting of alkyl groups containing from 6 to 18 carbon atoms.

4,954,546

PVC RESIN BLEND COMPOSITIONS STABILIZED WITH LAURYLTIN COMPOUNDS

Gerd Abeler, Darmstadt, and Hans J. Sander, Lorsch, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 219,900, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 54,718, May 27, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 317,039

Claims priority, application Switzerland, May 30, 1986, 2207/86

Int. Cl.[5] C08K *5/58*

U.S. Cl. 524—180 **12 Claims**

1. In a polymer blend of 20 to 80% by weight of poly(vinylchloride) and 80 to 20% by weight of at least one copolymer selected from the group consisting of polystyrene/polyethylene/butylene, acrylate/rubber, acrylate/rubber/styrene, acrylonitrile/styrene/acrylate, acrylonitrile/butadiene/styrene, acrylonitrile/butadiene, acrylonitrile/acrylate, styrene/acrylonitrile, ethylene/vinyl acetate, and modified ethylene/vinyl acetate, which blend contains a dialkyl-tin mercaptide stabilizer, the improvement reducing loss of the stabilizer from the blend upon prolonged exposure to light and heat which comprises employing as the dialkyl-tin mercaptide an effective stabilizing amount of at least one compound of the formula:

$$(n\text{-}C_{12}H_{25})_2Sn[S(CH_2)_nCOOR]_2 \text{ or}$$

$$(n\text{-}C_{12}H_{25})Sn[S(CH_2)_nCOOR^1]_3$$

wherein n is 1 or 2, and each of R and R^1, independently of the other, is alkyl of 6 to 18 carbon atoms.

4,954,547

USE OF FATTY ACIDS FOR IMPROVEMENT IN SHEAR STABILITY OF WATER-IN-OIL EMULSIONS

Merle L. Branning, Warrenville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 41,492, Apr. 23, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 158,103

Int. Cl.[5] C08K *5/20*

U.S. Cl. 524—232 **1 Claim**

1. A water-in-oil emulsion having improved mechanical shear stability which contains:

a. water phase having dissolved therein a water-soluble acrylic acid polymer having a molecular weight of at least 500,000;

b. an oil phase;

c. a water-in-oil emulsifying agent; and additionally contains from 0.5 to 5.0 weight percent of a mechanical shear stabilizing agent of an admixture of oleic acid and a 1:1 mole ratio of oleic/linoleic diethanolamide, said shear stabilizing agent being further characterized as acting as an inverting agent which allows the water-soluble acrylic acid polymer to be dissolved rapidly in water.

4,954,548

ETHYLENE-CARBON MONOXIDE COPOLYMER STABILIZATION

George B. Klingensmith, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 27, 1989, Ser. No. 343,770

Int. Cl.[5] C08K *5/18*

U.S. Cl. 524—258 **20 Claims**

1. A composition stabilized against degradation caused by exposure to UV light which comprises a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a stabilizing quantity of a mixture of a diphenylamine and a weakly acidic channel-type carbon black with a pH from about 3.5 to about 6.5.

4,954,549

SUBSTANTIALLY TRANSPARENT FLAME RETARDANT AROMATIC POLYCARBONATE COMPOSITIONS

Larry N. Lewis, Scotia, and Stephen C. Bunnell, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,094

Int. Cl.[5] C08L *5/54*

U.S. Cl. 524—264 **5 Claims**

1. A substantially transparent flame retardant halogen-free aromatic polycarbonate comprising an aromatic polycarbonate resin, and an effective amount of a triarylsilane of the formula

$$(R)_3SiY \quad (1)$$

where R is a $C_{(6-13)}$ aromatic organic radical and Y is a member selected from the class consisting of vinyl, OH and $(R)_3Si$-.

4,954,550

SYSTEM FOR THERMOPLASTIC CROSS-LINKING ADHESIVES, THEIR PREPARATION AND A CORRESPONDING METHOD OF GLUING

Kurt Sorg, Eragny, France, assignor to Societe Chimique des Charbonnages S.A., France

PCT No. PCT/FR87/00237, § 371 Date Apr. 1, 1988, § 102(e) Date Apr. 1, 1988, PCT Pub. No. WO88/00225, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 22, 1987, Ser. No. 163,753

Claims priority, application France, Jun. 27, 1986, 86 09391

Int. Cl.[5] C08L *5/01, 5/11, 5/12;* **C09J** *153/02*

U.S. Cl. 524—271 **13 Claims**

1. A system for a thermoplastic cross-linking adhesive comprising:

A. a first composition not containing any anhydride groups and comprising per 100 parts per weight of said first composition:

(a) from 25 to 60 parts by weight of at least one polymer chosen from thermoplastic polymers and synthetic rubbers;

(b) from 1 to 20 parts by weight of at least one compound containing at least one group capable of reacting with anhydride groups;

(c) from 5 to 60 parts by weight of at least one tackifying resin; and

(d) 0 to 20 parts by weight of at least one plasticizer;

B. a second composition containing per 100 parts per weight of said second composition:

(a) from 50 to 30 parts by weight of at least one polymer chosen from thermoplastic polymers and synthetic rubbers;

(b) from 20 to 60 parts by weight of at least one compound containing at least one anhydride group;

(c) from 5 to 60 parts by weight of at least one tackifying resin; and

(d) from 0 to 20 parts by weight of at least one plasticizer;

C. at least one activator of the reaction between the reactive groups of the constituent Ab and the anhydride functions of the constituent Bb;

wherein the molar ratio of the reactive groups of the constituent Ab to the anhydride groups of the constituent Bb is at least equal to 1, and the molar ratio of the activator C to the anhydride groups of the constituent Bb is at least equal to 0.5;

the thermoplastic polymers included in the definition of the constituents Aa and Ba are selected from the group consisting of the group consisting of C_2–C_{12} alkene/C_1–C_{12}-alkyl (meth) acrylate copolymers, and the polymers of norbornene and/or of its derivatives;

the synthetic rubbers included in the definition of the con-

stituents Aa and Ba are selected from the group consisting of styrene-diene-styrene block copolymers;

the tackifying resins Ac and Bc are selected from the group consisting of polyterpenes, colophonies and colophony esters as well as their hydrogenated derivatives, and petroleum resins;

the plasticizers Ad and Bd are selected from the group consisting of polyterpenes, colophonies and colophony esters as well as their hydrogenated derivatives, and petroleum resins;

the plasticizers Ad and Bd are selected from the group consisting of semi-aliphatic oils, polyisobutylenes of very low molecular weight and aromatic, naphthenic or paraffinic petroleum oils, alkylbenzenes, esters derived from saturated organic acids, and ethylene-vinyl acetate copolymers of very low molecular weight; and

the activator C is selected from the group consisting of tertiary amines, phosphines, aryl or alkyl phosphonium halides and the tertiary amides of fatty acids.

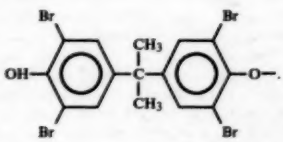
4,954,551
HALOGEN-CONTAINING ORGANOMETALLIC COMPOUNDS

Robert A. Schleifstein, Baton Rouge, La., and Mohammed A. Khuddus, Matawan, N.J., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 31, 1989, Ser. No. 331,163
Int. Cl.[5] C08K *5/59*; C07F *9/94, 9/92*
U.S. Cl. 524—327 **6 Claims**

1. A compound of the formula

wherein: M is Sb(III) or Bi(III), x and y are whole integers and x=1, 2, or 3, y=0, 1 or 2 and $x+y=3$; each R is independently selected from hydroxy radicals, alkoxy radicals and phenoxy radicals; and each R′ is



4. A formulation comprising a flammable macromolecular material and a flame retardant amount of the compound of claim 1.

4,954,552
STABILIZED CARBON MONOXIDE-OLEFIN COPOLYMER COMPOSITIONS

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1989, Ser. No. 351,510
Int. Cl.[5] C08K *5/07*
U.S. Cl. 524—356 **14 Claims**

1. A composition stabilized against undue loss of crystallinity when subjected to melting and solidification which comprises:

a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, wherein the polymer is of the repeating formula

$$-CO-CH_2-CH_2)]_x[CO-G]_y$$

wherein G is a moiety of an ethylenically unsaturated hydrocarbon of at least 3 carbon atoms polmerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0.5; and

a stabilizing quantity of barium acetylacetonate or titanium acetylacetonate.

4,954,553
MODIFIED WATERBORNE PHENOXY RESINS

Robert N. Johnson, Basking Ridge, N.J., and Ismael Colon, Cary, N.C., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Sep. 30, 1988, Ser. No. 251,253
Int. Cl.[5] C08K *5/06*
U.S. Cl. 524—376 **23 Claims**

1. An aqueous coating composition comprising:

(a) a waterborne, neutralized, carboxyl-bearing phenoxy resin,

(b) abut 5 to about 50% by weight of the total resin of a modifier resin which is relatively soft in comparison to the phenoxy resin and is compatible with the phenoxy resin and has:

(1) a reduced viscosity of about 0.1 to about 2 dL/g in tetrahydrofuran at 25° C.;

(2) a Tg of about −120 to about 30° C.;

(3) a solubility in Cellosolve acetate at 25° C. of at least about 1 g per 100g of solvent;

(4) a number average molecular weight of about 500 to about 90,000,

said modifier resin being a neutral, non-carboxylbearinq, liquid or waterborne resin which will form a clear film with the waterborne phenoxy resin at 25–300 degrees centigrade upon evaporation of any solvents and all the water in the system;

(c) optionally, about two to about 25% by weight of the total emulsion of a coalescing solvent, with a relative evaporation rate above about 0.001 (butyl acetate=100), for the waterborne phenoxy-modifier resin mixture;

(d) optionally, a particulate material;

(e) optionally, a crosslinker;

(f) water in an amount sufficient to disperse the phenoxy and modifier resins therein.

4,954,554
SILICONE EMULSIONS

David J. Bunge, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 27, 1989, Ser. No. 316,376
Int. Cl.[5] C08K *5/05*
U.S. Cl. 528—388 **18 Claims**

1. An emulsion composition consisting essentially of:

(A) a curable composition comprising an organopolysiloxane bearing silicon-bonded curing radicals selected from the group consisting of the hydroxyl radical and olefinic radicals;

(B) a polyvinylalcohol emulsifying agent, having an average degree of hydrolysis of at least 90 mol % , as the sole emulsifying agent and

(C) water.

4,954,555
STABILIZED CARBON MONOXIDE-OLEFIN COPOLYMER COMPOSITIONS

Edgar J. Smutny, Houston, Tex., and Robert G. Lutz, Santa Rosa, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed May 30, 1989, Ser. No. 358,218
Int. Cl.[5] C08K *5/09*
U.S. Cl. 524—399 **11 Claims**

1. A composition stabilized against undue loss of crystallinity when subjected to melting and solidification which comprises a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, wherein the polymer is of the repeating formula

$$-CO-CH_2-CH_2]_x[CO-G]_y$$

wherein G is a moiety of an ethylenically unsaturated hydrocarbon of at least 3 carbon atoms polymerized through the ethylenic unsaturation and the ratio of y:x is no more than about 0.5, and a stabilizing quantity of aluminum stearate.

4,954,556

WATER-BASED INK COMPOSITIONS

Larry J. Bull, Marietta, Ga.; Raymond Sieradzki, North Huntingdon, and Kurt G. Olson, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 123,627, Nov. 23, 1987, abandoned. This application Nov. 20, 1989, Ser. No. 439,013

Int. Cl.[5] C08K *5/06*

U.S. Cl. 524—378 **6 Claims**

1. A water-based fast-drying ink composition comprising:

(a) a water-based polymer prepared by an emulsion polymerization technique, having a Tg of about 50° C. to 120° C. or higher,

(b) a surfactant in an amount of about 15 to 50 percent by weight solids of the ink composition.

4,954,557

PROCESS FOR PREPARING MOLDED ARTICLE

Teruo Iwanami, Ibaraki; Shigeo Miyata, Takamatsu, and Takamasa Moriyama, Suita, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka and Kyowa Kogyo Kabushiki Kaisha, Kagawa, both of, Japan

Filed Jan. 25, 1989, Ser. No. 301,903

Int. Cl.[5] C08K *3/26, 3/24;* **C08L** *29/04, 23/02*

U.S. Cl. 524—399 **7 Claims**

1. In a process for preparing a molded article by melt-molding a mixture of (A) a hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 20 to 80% by mole and a degree of hydrolysis in the vinyl acetate units of at least 90% by mole and (B) an olefin resin,

the improvement which comprises melt-molding said mixture in the presence of a hydrotalcite solid solution (C) having the formula (I):

$$\{(M_1^{2+})_{y1}(M_2^{2+})_{y2}\}_{1-x}(M^{3+})_x(OH)_2(A^{n-})_{x/n\cdot m}\cdot H_2O \quad (I)$$

wherein M_1^{2+} is at least one metal selected from Mg, Ca, Sr and Ba; M_2^{2+} is Zn, Cd, Pb or Sn; M^{3+} is a trivalent metal; A^{n-} is an anion with a valence of n; x is a positive number satisfying the equation: $0<x\leqq 0.5$; y1 and y2 are positive numbers satisfying the equations: $0.5<y1<1$, $y1+y2=1$; and m is a positive number satisfying the equation: $0\leqq m<2$.

5. The process of claim 1, wherein said mixture is melt-molded in the presence of a metal salt of higher fatty acid having 10 to 22 carbon atoms (D) in addition to said hydrotalcite solid solution (C).

4,954,558

RESIN-FORTIFIED EMULSION POLYMERS AND METHODS OF PREPARING THE SAME

Sheng-Liang Tsaur, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 205,536, Jun. 9, 1988, Pat. No. 4,820,762, which is a continuation of Ser. No. 899,281, Aug. 22, 1986, abandoned. This application Jan. 11, 1989, Ser. No. 296,248

Int. Cl.[5] C08F *2/16*

U.S. Cl. 525—460 **2 Claims**

1. A resin-fortified polymer emulsion having Newtonian-like flow characteristics, the resin-fortified polymer emulsion being made by a method which comprises the following steps:

(a) emulsion-polymerizing a monomer charge comprising at least one emulsion-polymerizable monomer in the presence of a polymeric stabilizer and an initiator under emulsion-polymerization reaction conditions effective for initiating emulsion polymerization of an emulsion-polymerization mixture, the polymeric stabilizer being present in an amount that is effective for preventing coagulation of emulsion polymer particles which are forming in the emulsion-polymerization mixture; and thereafter

(b) adding to the emulsion-polymerization mixture, while emulsion polymerization of the emulsion-polymerizable monomer is occurring, an effective amount of at least one support resin for controllably affecting the physical characteristics of the emulsion polymer product, said resin being selected from the group consisting of water soluble resins, water dispersible resins, alkali soluble resins, alkali dispersible resins and mixtures thereof, said resin having been produced either by a solution-polymerization method or by a bulk-polymerization method, wherein the resin is produced from at least one ethylenically-unsaturated monomer selected from the group consisting of olefins, mono vinylidene aromatics, alpha beta ethylenically-unsaturated carboxylic acids and esters thereof, ethylenically-unsaturated dicarboxylic anhydrides, and mixtures thereof,

thereby producing the resin-fortified polymer emulsion having Newtonian-like flow characteristics.

4,954,559

WATERBASED METHYLOL (METH) ACRYLAMIDE ACRYLIC POLYMER AND POLYURETHANE CONTAINING COATING COMPOSITION

Herman C. Den Hartog, Rochester, Mich.; Eileen E. Konsza, Swedesboro, N.J.; James F. Matthews, and Ervin R. Werner, Jr., both of Levittown, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 5, 1989, Ser. No. 402,293

Int. Cl.[5] C08F *20/58;* **C08L** *75/06, 75/08*

U.S. Cl. 524—507 **18 Claims**

1. A waterbased coating composition comprising about 10–30% by weight of film forming binder dispersed in an aqueous carrier; wherein the binder consist essentially of about

a. 60–90% by weight, based on the weight of the binder, of an methylol (meth)acrylamide acrylic polymer consisting essentially of polymerized monomers of alkyl methacrylate, alkyl acrylate or mixtures thereof, 1–10% by weight, based on the weight of the acrylic polymer, of methylol methacrylamide, methylol acrylamide or mixtures thereof, 0.5–10% by weight, based on the weight of the acrylic polymer of an ethylenically unsaturated carboxylic acid, 0.5–10% by weight, based on the weight of the acrylic polymer, of an ethylenically unsaturated hydroxyl containing monomer, said acrylic polymer having a glass transition temperature of −40° to +40° C. and a weight average molecular weight of 500,000 to 3,000,000; and the carboxyl groups of the carboxylic acid are reacted with ammonia to provide a pH of about 7.0–10;

b. 10–40% by weight, based on the weight of the binder, of a polyurethane selected from the group consisting of polyester urethane, polyether urethane or polyacryloure-thane.

4,954,560

STABLE POLYMER/POLYOLS MADE WITHOUT MACROMONOMER

Richard M. Gerkin; Michael W. Jorgenson, both of Cross Lanes, W. Va., and Paul W. Leuzzi, II, New Milford, Conn., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jun. 30, 1989, Ser. No. 373,923

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—714 **11 Claims**

1. A process for the preparation of a stable polymer polyol which comprises the in situ reaction of a monomer mixture in a polyol blend wherein at least one monomer of the monomer mixture is a bifunctional compound containing both an isocya-

nate group and an ethylenically unsaturated group and wherein the polyol blend comprises:

(a) a base polyol and

(b) an effective amount of an amine terminated polyether which is more reactive with the bifunctional compound than is the base polyol and which has a molecular weight approximately equal to or greater than the base polyol and wherein the ratio of the bifunctional compound the amine terminated polyether is in the range of from about 0.5 to about 1.5 moles of bifunctional compound per mole of amine terminated polyether.

4,954,561

STABILIZERS FOR POLYMER/POLYOLS

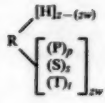
Richard M. Gerkin, and John F. Timberlake, both of Cross Lanes, W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jun. 30, 1989, Ser. No. 373,925

Int. Cl.[5] C08L *33/00*

U.S. Cl. 524—728 **10 Claims**

1. A process for the manufacture of polymer polyol stabilizers which comprises reacting a bifunctional unsaturated compound with an amine of the general formula:



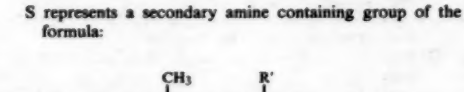
wherein:

R represents an initiator radical based on a compound containing Zerewitinoff active hydrogen atoms;

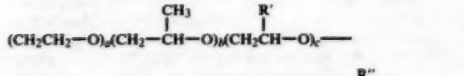
H represents a hydroxy containing group of the formula:

P represents a primary amine containing group of the formula:

S represents a secondary amine containing group of the formula:



T represents a tertiary amine containing group of the formula:



a is 0 to 175;

b is 0 to 175;

c is 0 to 30;

n is 1 to 3;

the sum a+b+c must be greater than or equal to 2 when n equals 1;

R′ is an alkyl group containing from two carbon atoms to eighteen carbon atoms;

R″ is hydrogen or an alkyl group containing up to eighteen carbon atoms;

R‴ and R⁗ are independently alkyl groups containing from two to twelve carbon atoms;

p is a mole fraction of the aminated portion of the amine reactant and is from 0 to less than 0.75;

s is a mole fraction of the aminated portion of the amine reactant and is from 0.25 to 1.0:

t is a mole fraction of the aminated portion of the amine reactant and is from 0 to 0.15;

w is the percent amination of the zerwitinoff active hydrogen atoms on the intermediate compound, generally 30 percent to 100 percent, and preferably 70 percent or more;

(zw) is the product of z and w;

$p+s+t=1$; and

z is an integer derived from the number of Zerewitinoff active hydrogens on the initiator.

4,954,562

WATER ABSORBENT RESINS

Mark Anderson, Wheaton, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 854,000, Apr. 21, 1986, Pat. No. 4,677,174, Ser. No. 872,654, Jun. 10, 1986, Pat. No. 4,755,562, and Ser. No. 67,233, Jun. 25, 1980, Pat. No. 4,802,773. This application Jan. 30, 1989, Ser. No. 303,815

Int. Cl.[5] C08K *3/22*; C08F *8/32*

U.S. Cl. 524—779 **44 Claims**

1. A process for preparing a solid water absorbing resin comprising mixing a solution of (A) acrylic acid neutralized 70–100 mole percent; (B) a non-reactive and water-insoluble metal oxide in an amount of about 0.001% to about 5% based on the total weight of the solution; and (C) a water-miscible to water-soluble polyvinyl monomer in a combined concentration of (A), (B) and (C) of at least 30 wt. %; with water to form a mixed solution wherein the monomers of the mixed solution consist essentially of (A) and (C) and initiating polymerization of monomers (A) and (C) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, crosslinking and to drive off sufficient water to obtain a solid crosslinked resin including metal oxide (B) and having a water content of 15 percent by weight or less.

4,954,563

MONOAZO DYES CONTAINING SULFOINDOLE COUPLING COMPONENTS

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

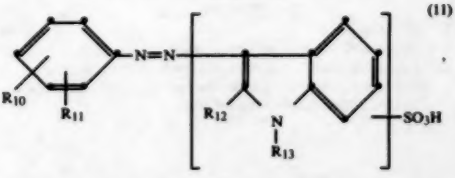
Filed Feb. 27, 1984, Ser. No. 584,176

Claims priority, application Switzerland, Mar. 8, 1983, 1246/83

Int. Cl.[5] C09B *29/01, 29/40*; D06P *1/39, 3/24*

U.S. Cl. 534—783 **11 Claims**

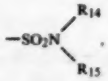
1. A monoazo dye of the formula



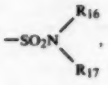
(11)

wherein R_{10} is hydrogen and R_{11} is phenoxy or naphthoxy

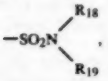
each unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino or hydroxyl, or



and R_{14} and R_{15} are each independently C_{1-4}-alkyl, C_{1-4}-hydroxyalkyl or C_{5-7}-cycloalkyl; or R_{10} is C_{1-4}-alkyl and R_{11} is phenoxy or naphthoxy each unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino or hydroxyl; or R_{10} is C_{1-4}-alkoxy and R_{11} is hydrogen, halogen, C_{1-12}-alkyl, phenoxy, naphthoxy, phenoxysulfonyl, naphthoxysulfonyl each unsaturated or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino or hydroxyl, or



and R_{16} and R_{17} are each independently C_{1-12}-alkyl unsubstituted or substituted by halogen, hydroxyl, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl or benzoyl, cycloalkyl containing 5- to 7-membered ring unsubstituted or substituted by C_{1-4}-alkyl; or R_{10} is halogen and R_{11} is phenoxy or naphthoxy each unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino or hydroxyl; or R_{10} is C_{2-4}-alkanoylamino and R_{11} is hydrogen, halogen, C_{1-12}-alkyl, phenoxy, naphthoxy, phenoxysulfonyl or naphthoxysulfonyl each unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino or hydroxyl, or



and R_{18} and R_{19} are each independently C_{1-12}-alkyl unsubstituted or substituted by halogen, hydroxyl, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl or benzoyl, cycloalkyl containing 5- to 7-membered ring unsubstituted or substituted by C_{1-4}-alkyl; or phenyl or naphthyl each unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, trifluoromethyl, C_{1-6}-alkanoylamino, hydroxyl or carbonyl; R_{12} is C_{1-12}-alkyl unsubstituted or substituted by halogen, hydroxyl, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl or benzoyl or phenyl or naphthyl each unsubstituted or substituted by C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, trifluoromethyl, C_{1-6}-alkanoylamino, hydroxyl, carboxyl or sulfo; and R_{13} is hydrogen or C_{1-12}-alkyl.

4,954,564

PROCESS FOR PREPARING UNSATURATED NITROGEN CONTAINING ACIDS

Woodrow W. White, Akron, Ohio, assignor to GenCorp Inc., Fairlawn, Ohio

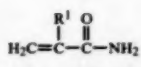
Continuation of Ser. No. 930,485, Nov. 14, 1986. This application Jul. 5, 1988, Ser. No. 214,968

Int. Cl.[5] C08J *33/00*

U.S. Cl. 524—813 **5 Claims**

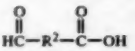
1. A process for preparing a solution containing an unsaturated nitrogen containing acid, comprising the steps of:

adding an unsaturated amide reactant to a vessel, said unsaturated amide having the formula



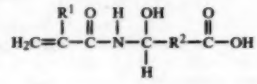
where R^1 is H, or an alkyl having from 1 to 3 carbon atoms,

adding an aldehyde acid reactant to said vessel, said aldehyde acid having the formula



where R^2 is nonexistent, CH_2, or C_2H_4, wherein the amount of said unsaturated amide is from 1.2 to about 2.4 equivalents for each equivalent of aldehyde acid,

reacting said reactants in the presence of an acidic aqueous reaction medium having an acidic pH of from about 1.2 to less than 7.0 and producing a salt free unsaturated nitrogen containing acid, said unsaturated nitrogen containing acid having the formula



wherein R^1 is H, or an alkyl having from 1 to 3 carbon atoms, wherein R^2 is nonexistent, CH_2, or C_2H_4,

adding said unsaturated nitrogen containing acid in said acidic aqueous reaction medium to a latex forming monomer solution, and

polymerizing said latex solution.

4,954,565

PRECURED SILICONE EMULSION

Donald T. Liles, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 25, 1989, Ser. No. 411,800

Int. Cl.[5] C08L *83/04*

U.S. Cl. 524—860 **21 Claims**

1. An aqueous silicone emulsion having an improved shelf life and which yields an elastomer upon removal of the water at ambient conditions comprising

(1) 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of above 50,000, the organic radicals being monovalent hydrocarbon radicals containing less than 7 carbon atoms per radical or 2-(perfluoroalkyl-)ethyl radicals having less than 7 carbon atoms per radical, present as an emulsion of dispersed particles in water, the emulsion having a pH of from 4 to 10.5,

(2) from 0.1 to 1.0 parts by weight of tin (II) (stannous) catalyst,

(3) from 0.1 to 5 parts by weight of crosslinker selected from the group consisting of (a) silane of the formula $R_aSi(OR')_{4-a}$ where R is hydrogen, monovalent hydrocarbon radical or substituted hydrocarbon radical of from 1 to 6 carbon atoms inclusive, functionalized hydrocarbon radicals, or amine containing radicals, with the proviso that R be chosen such that the crosslinker must be capable of migrating from the aqueous phase into the emulsion micelle of (1) , R' is a lower alkyl radical of from 1 to 6 carbon atoms inclusive or a radical of the formula $-N{=}CR''_2$ where R'' is hydrogen or monovalent hydrocarbon radical of from 1 to 6 carbon atoms inclusive, a is 0 or 1; (b) siloxane having at least 3 reactive groups bonded to silicon per molecule, the reactive group being selected from the group consisting of hydrogen, reactive group of the formula OR' where R' is as defined above, and an amine radical of the formula $-NR''_2$ where R'' is as defined above; and (c) silazane of the formula R_a-$Si(NR''_2)_{4-a}$ where R, R'', and a are as defined above, and

(4) colloidal silica reinforcement,

the emulsion being able to be reinforced with colloidal silica

without loss of shelf life, and yielding an elastomer upon removal of the water.

4,954,566

PREPARATION OF POLYMERS WITH PENDANT ORGANIC MOIETIES BOUND THERETO VIA ESTER AND/OR AMIDE BRIDGES

John W. Gowan, Jr., Washington, D.C., assignor to Westvaco Corporation, New York, N.Y.

Filed May 4, 1989, Ser. No. 347,328
Int. Cl.[5] C08F 8/14
U.S. Cl. 525—61 20 Claims

1. A one pot process for preparing a polymer carrying pendant organic residues attached to the polymer via a linking bridges, comprising

forming an organic solvent solution or suspension of an organic acid, the solvent being capable of forming a water-solvent azeotropic solution;

combining 2 molecules of the acid to form the corresponding organic acid anhydride and water and distilling off a water-solvent azeotropic solution from an organic solvent solution or suspension of the anhydride;

admixing into the solvent solution or suspension of said anhydride a polymer selected from the group consisting of polymers having pendant residues capable of reacting with a —COOH or a $=(CO)_20$ residue under conditions effective to form free organic acid and a derivatized polymer, said polymer having a pendant residue(s) of said anhydride attached thereto via a bridge resulting from the reaction of the $=(CO)_20$ residue of the anhydride and the residue of the polymer; and

separating the derivatized polymer from the free organic acid solution or suspension.

4,954,567

PROCESS FOR PREPARING POLYVINYL ALCOHOL HAVING HIGH DEGREE OF POLYMERIZATION

Tsukasa Oishi, Muko, and Tomohisa Okuda, Nara, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaki, Japan

Filed Apr. 1, 1988, Ser. No. 176,534
Claims priority, application Japan, May 30, 1987, 62-137346
Int. Cl.[5] C08F 8/00
U.S. Cl. 525—62 8 Claims

1. A process for preparing polyvinyl alcohol particles, a 4% of by weight aqueous solution of which has a viscosity at 20° C. of not less than 80 cps, which comprises stirring in a heterogenous system polyvinyl ester particles having an intrinsic viscosity of not less than 1.3 dl/g with a solution consisting essentially of an alcohol and an alkali catalyst, said solution containing from 0.18 to 10 moles of the alkali catalyst per liter of the alcohol.

4,954,568

IMPACT RESISTANT BLENDS OF THERMOPLASTIC POLYESTERS AND MODIFIED BLOCK COPOLYMERS

Richard Gelles; Carl L. Willis, both of Houston, Tex.; Robert G. Lutz, Santa Rosa, Calif., and William P. Gergen, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 140,008, Dec. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 766,216, Aug. 16, 1985, Pat. No. 4,797,447. This application Feb. 15, 1989, Ser. No. 311,009
Int. Cl.[5] C08L 67/02; C08F 297/04
U.S. Cl. 525—92 7 Claims

1. A process for producing a toughened polymeric composition having an Izod impact greater than 10 ft-lb/in comprising the steps of:

(a) providing a functionalized selectively hydrogenated block copolymer comprising,

(i) at least on polymer block A, block A being predominantly a polymerized alkenyl arene block,

(ii) at least one selectively hydrogenated polymer block B, block B being predominantly a polymerized block of at least one conjugated diene, and

(iii) grafted predominantly to the A blocks on the average of from one carbonyl group for each 44 alkenyl arene monomer units to one carboxyl group for each 6.6 alkenyl arene monomer units;

(b) acidifying the functionalized selectively hydrogenated block copolymer by contacting the functionalized selectively hydrogenated block copolymer with an organic acid to form an acidified functionalized selectively hydrogenated block copolymer;

(c) neutralizing a portion of the acidified functionalized selectively hydrogenated block copolymer by contacting the acidified functionalized selectively hydrogenated block copolymer with an amount of metal salt effective to neutralize from about 19 mole percent to about 55 mole percent of the carboxylic acid functionality of the acidified functionalized block copolymer to form a partially neutralized functionalized block copolymer;

(d) blending the partially neutralized functionalized block copolymer with a thermoplastic polymer composition comprising poly(1,4-butylene terephthalate) wherein the thermoplastic polymer is present in a weight ratio of about 50:50 up to about 85:15 relative to the functionalized hydrogenated block copolymer; and

(e) recovering a toughened polymeric composition.

4,954,569

USE OF HOMOPOLYCARBONATES OF 3,3'-DIHYDROXYDIPHENYL ETHER FOR MODIFYING FILMS OF THERMOPLASTICS

Günther Weymans, Bayer Aktiengesellschaft, D-5090 Leverkusen; Klaus Berg, Bayer Aktiengesellschaft, D-4150 Krefeld-Uerdingen; Ulrich Grigo, Bayer Aktiengesellschaft, D-4150 Krefeld-Uerdingen; Karsten-Josef Idel, Bayer Aktiengesellschaft, D-4150 Krefeld-Uerdingen, and Ludwig Bottenbruch, Woehlerstrasse 5, D-4150 Krefeld, all of Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,086
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1988, 3823306
Int. Cl.[5] C08L 69/00
U.S. Cl. 525—146 12 Claims

1. Films of thermoplastics modified by the addition of 3% to 30% by weight of thermoplastic homopolycarbonates of 3, 3'-dihydroxydiphenyl ether, the thermoplastics being selected from: polycarbonates based on diphenols, excepting homopolycarbonates of 3,3'-dihydroxyphenyl ether; aromatic polyester carbonates; aliphatic polyesters; polyamides; thermotropic polymers; homopolymers or copolymers of poly-C_1–C_4-alkyl methacrylates; linear and branched polyarylene sulfides; polyarylene sulfones; polyphenylene oxides and; copolymers of styrene or styrene and methyl styrene with acrylonitrite or acrylonitrile and methacrylonitrile.

4,954,570

POLYKETONE POLYMER BLEND

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 24, 1988, Ser. No. 198,546
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] C08L 71/00
U.S. Cl. 525—185 14 Claims

1. A composition comprising a non-miscible blend of (a) a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon of from 2 to 20 carbon atoms inclusive and (b) an propylene-α,β-ethylenically unsaturated carboxylic acid copolymer, said α,β-ethylenically unsaturated carboxylic acid having up to 10 carbon atoms, wherein the acid is present in the copolymer in a quantity of about 0.1% to about 35% by weight based on the total copolymer and

wherein the amount of said propylene-α,β-ethylenically unsaturated carboxylic acid in said blend is 0.01% to 35% by weight based on the total blend.

4,954,571

RUBBER DISPERSED COPOLYMER RESIN

Mune Iwamoto, Yokohama; Norifumi Ito, Kamakura; Sugazaki: Kazuo, Yokohama; Tetsuyuki Matsubara, Yokohama, and Toshihiko Ando, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 899,867, Aug. 25, 1986, Pat. No. 4,808,661. This application Sep. 26, 1988, Ser. No. 248,951

Claims priority, application Japan, Aug. 27, 1985, 60-186638; Dec. 27, 1985, 60-293192

Int. Cl.[5] C08L *35/06, 35/04*

U.S. Cl. 525—205 **17 Claims**

1. A rubber dispersed copolymer resin composition comprising:

(a) a dispersed phase formed of a multicomponent gel, which contains the following three components:

(i) a rubber selected from the group consisting of polybutadiene rubber, acrylonitrile-butadiene copolymer rubber, styrene-butadiene copolymer rubber, acrylic rubber and ethylene-propylene-diene terpolymer rubber;

(ii) a copolymer of a styrene monomer; and an acrylonitrile monomer;

(iii) a copolymer of a styrene monomer, an acrylonitrile monomer and an maleimide monomer,

wherein

the rubber (i) is contained in an amount of 30 to 70 weight percent and the total amount of the latter two copolymers (ii) and (iii) is 70 to 30 weight percent based on the total amount of the multicomponent gel, the crosslinking degree index of the dispersed phase being 4 to 11, the total amount of multicomponent gel particles, each of which contains at least one cell having a diameter of at least 0.05 μm, accounts for at least 50 weight percent of the whole multicomponent gel; and

(b) a continuous phase which is formed of a copolymer of 10 to 80 weight percent of styrene monomer, 15 to 50 weight percent of acrylonitrile monomer and 1 to 30 weight percent of maleimide, the reduced viscosity of an 0.5 weight percent solution of the continuous phase forming copolymer in dimethylformamide being 0.5 to 1.0 dl/g at 30° C.; said rubber being contained in an amount of 3 to 20 weight percent on the total weight of said resin composition.

4,954,572

DISPERSANT ADDITIVES PREPARED FROM MONOEPOXY ALCOHOLS

Jacob Emert, Brooklyn, N.Y., and Robert D. Lundberg, Bridgewater, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Nov. 7, 1988, Ser. No. 268,135

Int. Cl.[5] C08F *255/08*

U.S. Cl. 525—285 **15 Claims**

1. An oil soluble adduct useful as an oil additive to oleaginous fluids comprising a polymer-substituted epoxy ester adduct of:

(A) a long chain hydrocarbyl polymer substituted with at least one of C_4 to C_{10} monounsaturated dicarboxylic acid producing moieties and C_3 to C_{10} monounsaturated monocarboxylic acid producing moieties, said substituted polymer formed by reacting an olefin polymer of C_2 to C_{10} monoolefin having a number average molecular weight of about 700 to 5,000 and a monounsaturated carboxylic reactant comprising at least one member selected from the group consisting of (i) monounsaturated C_4 to C_{10} dicarboxylic acids; (ii) anhydride and C_1 to C_5 alcohol derived mono- or di-ester derivatives of (i); (iii) monounsaturated C_3 to C_{10} monocarboxylic acids wherein the carbon-carbon double bond is conjugated to the carboxy group; and (iv) C_1 to C_5 alcohol derived monoester derivatives of (iii); and

(B) a monoepoxy alcohol.

4,954,573

MODIFIED CHLORINATED POLYOLEFINS

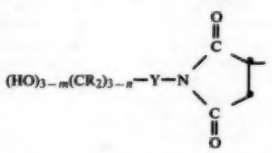
Slaton E. Fry; David W. Magouyrk; Allen J. Blankenship, all of Batesville, Ark.; Paul J. Greene, and Larry K. Johnson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 196,659, May 20, 1988. This application Jan. 16, 1990, Ser. No. 466,124

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—327.6 **8 Claims**

1. The novel polymer composition comprising a polyolefin of at least one olefin selected from the group consisting of C_2 up to C_{10} olefins; wherein said polyolefin contains in the range of about 10 up to 40 weight % chlorine; wherein said polyolefin further contains in the range of about 10 up to 30 hydroxyimide moieties per polymer chain pendant directly from the chain; wherein said hydroxyimide has the structural formula:



wherein m=0, 1 or 2; n=0, 1, 2 or 3; R is H or a hydrocarbyl radical having in the range of 1 up to 20 carbon atoms; and Y is a hydrocarbyl moiety having in the range of 1 up to 20 carbon atoms.

4,954,574

IMIDE POLYMERS

Michael P. Hallden-Abberton, Maple Glen; Newman M. Bortnick, Oreland; Leslie A. Cohen, Langhorne, all of Pa.; William T. Freed, Stockton, N.J., and Harry C. Fromuth, Trevose, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 108,383, Nov. 23, 1987, abandoned, which is a division of Ser. No. 770,034, Aug. 27, 1985, Pat. No. 4,727,117. This application Dec. 19, 1989, Ser. No. 452,991

Int. Cl.[5] C08F *8/32*

U.S. Cl. 525—327.6 **17 Claims**

1. A polymer containing glutarimide units wherein the degree of imidization, by weight, on said polymer is from about 1% to about 95%, and the degree of imidization and the acid and anhydride functionality on said polymer, expressed in milliequivalents per gram of total imidizable and imidized polymer units are as set forth below:

when the degree of imidization on said polymer is	the milliequivalents of acid and anhydride per gram are
from about 1% to about 10%	0 to about 0.20
above about 10% to about 20%	0 to about 0.28
above about 20% to about 30%	0 to about 0.32
above about 30% to about 40%	0 to about 0.31
above about 40% to about 50%	0 to about 0.28
above about 50% to about 60%	0 to about 0.28
above about 60% to about 70%	0 to about 0.27
above about 70% to about 80%	0 to about 0.28
above about 80% to about 90%	0 to about 0.33
and above about 90% to about 95%	0 to about 0.40

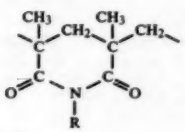
4,954,575

METHACRYLIMIDE CONTAINING POLYMER

Isao Sasaki, Otake; Kozi Nishida, Toyama, and Hisao Anzai, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,396
Claims priority, application Japan, Dec. 29, 1988, 63-334722
Int. Cl.[5] C08F 8/32
U.S. Cl. 525—330.5 7 Claims

1. A methacrylimide containing polymer comprising from 2 to 100% by weight of a structural unit represented by the general formula (I):



(I)

where R represents a hydrogen atom or an aliphatic group, aromatic group or cycloaliphatic hydrocarbon group with 1 to 20 carbon atoms, and from 0 to 98% by weight of a structural unit derived from an ethylenic monomer, the polymer having a distribution range of an imidization ratio of less than 5%.

4,954,576

PROCESS FOR HYDROGENATING CONJUGATED DIENE POLYMERS

Yoichiro Kubo, Yokohama, and Kiyomori Ohura, Kamakura, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,489
Claims priority, application Japan, Feb. 22, 1988, 63-39306
Int. Cl.[5] C08F 8/04
U.S. Cl. 525—339 15 Claims

1. A process for hydrogenating a conjugated diene polymer derived from 10 to 100% by weight of at least one conjugated diene monomer selected from the group consisting of 1,3-butadiene, 2,3-dimethylbutadiene, isoprene and 1,3-pentadiene and 90 to 0% by weight of an ethylenically unsaturated monomer copolymerizable with said at least one conjugated diene which comprises hydrogenating the carbon-carbon double bond of the conjugated diene polymer in the presence of a hydrogenation catalyst supported on a carrier, the carrier being an oxide of an element of Group IVa of the periodic table.

4,954,577

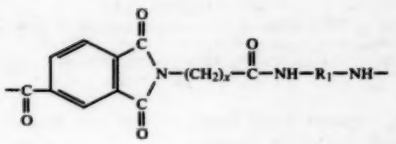
LACQUER BINDERS, COATING COMPOSITIONS AND WIRE ENAMELS BASED ON POLYAMIDEIMIDES AND ISOCYANATES CARRYING CARBODIIMIDE AND/OR URETONE IMINE GROUPS

Willi Dünwald; Hans Schlegel, both of Leverkusen; Reinhard Halpaap, and Josef Pedain, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 184,494
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714033
Int. Cl.[5] C08G 18/64, 18/80
U.S. Cl. 525—420 6 Claims

1. Lacquer binders containing polyamide imides suitable for the production of highly heat-resistant films and coatings mixtures of

(a) high molecular weight compounds containing recurring structural units corresponding to the following general formula



in which

R_1 is an alkylene radical, a cycloalkylene radical or an arylene radical optionally containing methylene bridges, these radicals optionally being substituted by alkyl groups or halogen, and

x is an integer of 2 to 12,

and organic compounds containing (i) carbodiimide and/or uretone imine groups and (ii) blocked isocyanate groups, with 1 to 100 parts by weight of component (b) being used to parts by weight of component (a).

4,954,578

FINE DOMAIN COMPOSITE FILMS OF POLYIMIDE MIXTURES

Moonhor Ree, Wappingers Falls, N.Y.; Sally A. Swanson, Calif.; Willi Volksen, both of San Jose, Calif., and Do Y. Yoon, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,559
Int. Cl.[5] C08L 79/08
U.S. Cl. 525—432 5 Claims

1. A thin film of polyimide having a glass transition temperature above 400° C, and good adhesion, said film comprising fine domains of about 1 μm diameter or smaller of relatively flexible fluorinated polyimide containing at least one fluorinated component in an amount from about 10–40% by weight of the total polyimide dispersed in a matrix of relatively rigid polyimide in an amount from about 60–90% by weight of total polyimide.

4,954,579

POLYALKYLOXAZOLINE-POLYCARBONATE-POLYALKYLOXAZOLINE TRIBLOCK COPOLYMER COMPATIBILIZER FOR POLYCARBONATE/POLYAMIDE BLENDS

Bruce P. Thill, and Bruce A. King, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 31, 1988, Ser. No. 264,920
Int. Cl.[5] C08G 73/02, 64/12; C08L 69/00
U.S. Cl. 525—467 12 Claims

1. A process for the preparation of a triblock copolymer, comprising the steps of sequentially:

(A) contacting together an ,α,Ω-hydroxyalkanoic acid having from 8 to 20 carbon atoms and an alkylsulfonyl halide or arenesulfonyl halide having from 7 to 14 carbon atoms, to prepare an Ω-sulfonylalkanoic acid;

(B) next, contacting the Ω-sulfonylalkanoic acid from step A with a chlorinating agent, to prepare an Ω-sulfonylalkanoyl chloride;

(C) thereafter, contacting the Ω-sulfonylalkanoyl chloride from step B with an aromatic dihydroxy compound and phosgene, under polycarbonate forming conditions, to prepare a polycarbonate having sulfonate end groups: and

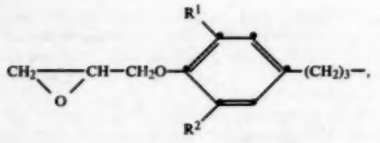
(D) finally, contacting the polycarbonate from step C with a 2-alkyl-2-oxazoline, to prepare a polyalkyloxazoline-polycarbonate-polyalkyloxazoline triblock copolymer.

4,954,580
EPOXYSILOXANES

Sheik A. Zahir, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 21, 1988, Ser. No. 273,525
Int. Cl.[5] C08G 77/04; C07D 303/02
U.S. Cl. 525—476 **15 Claims**

1. An epoxysiloxane having, per molecule, at least two groupings of the formula I



(I)

in which R^1 and R^2 independently of one another are C_1–C_{10}alkyl, C_1–C_{10}alkoxy, C_3–C_8cycloalkyl, Chd 6–C_{10}aryl, benzyl or a halogen atom and in which each grouping of the formula I in each case is attached directly to a silicon atom of the siloxane radical.

4,954,581
AMINO RESIN AND A METHOD FOR ITS PRODUCTION

Leif A. Flodman, Sundsvall, and Per E. G. Gabrielsson, Kvissleby, both of Sweden, assignors to Dynobel A/S, Stockholm, Sweden

Division of Ser. No. 147,298, Jan. 22, 1988, Pat. No. 4,857,609. This application Jun. 6, 1989, Ser. No. 362,684
Claims priority, application Sweden, Jan. 26, 1987, 8700292; Dec. 1, 1987, 8704793
Int. Cl.[5] C08L 61/00
U.S. Cl. 525—497 **1 Claim**

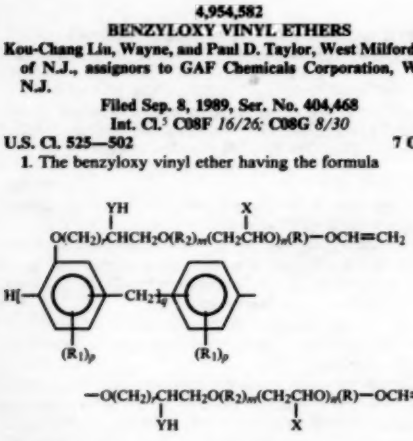
1. A process for the production of glued cellulose based products, such as particle boards, characterized in that the products are glued with an adhesive of which the resin component is a condensation product of formaldehyde, urea, phenol and optionally melamine with a molar ratio per mole formaldehyde of 1.4–0.8 moles of urea, 0.006–0.04 moles of phenol and 0–0.04 moles of melamine.

4,954,582
BENZYLOXY VINYL ETHERS

Kou-Chang Liu, Wayne, and Paul D. Taylor, West Milford, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Sep. 8, 1989, Ser. No. 404,468
Int. Cl.[5] C08F 16/26; C08G 8/30
U.S. Cl. 525—502 **7 Claims**

1. The benzyloxy vinyl ether having the formula



wherein

R_1 is lower alkyl;

p is an integer having a value of from 0 to 2;

q is an integer having a value of from 1 to 20;

r is an integer having a value of from 1 to 6;

n is an integer having a value of from 0 to 20;

m is an integer having a value of from 0 to 1;

Y is sulfur or oxygen;

X is hydrogen or methyl and

R and R_2 are each independently a radical having from 2 to 20 carbon atoms and are selected from the group of alkylene, arylene, aralkenylene and alkarylene optionally substituted with lower alkyl.

4,954,583
ARYLCYCLOBUTENE CARBOXYLATE ESTERS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 12, 1989, Ser. No. 364,275
Int. Cl.[5] C08G 59/16
U.S. Cl. 525—507 **28 Claims**

1. A 1-arylcyclobutenecarboxylate ester of a glycidyloxy compound wherein the arylcyclobutene moiety has up to 4 aromatic rings and up to 30 carbon atoms and has at least one cyclobutene ring fused to an aromatic ring, and the glycidyloxy compound has at least two glycidyloxy substituents.

4,954,584
THERMOSETTING RESIN COMPOSITIONS

Pen-Chung Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 12, 1989, Ser. No. 364,276
Int. Cl.[5] C08G 59/16
U.S. Cl. 525—507 **19 Claims**

1. A curable thermosetting resin composition comprising (a) a 1-arylcyclobutenecarboxylic acid ester of a glycidyloxy compound wherein the arylcyclobutene moiety has up to 4 aromatic rings and up to 30 carbon atoms, inclusive, and has at least one cyclobutene ring fused to an aromatic ring, and the glycidyloxy compound has at least two glycidyloxy substituents, and (b) at least one additional polymerizable monomer having at least two functional moieties in the molecule with multiple bonds between adjacent atoms.

4,954,585
PROCESS FOR THE PRODUCTION OF SULFUR-MODIFIED POLYCHLOROPRENE

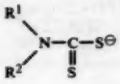
Werner Obrecht, Moers; Peter Wendling, Leverkusen; Rüdiger Musch, Bergisch-Gladbach, and Eberhard Müller, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 27, 1988, Ser. No. 289,816
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800263
Int. Cl.[5] C08C 19/20; C08F 2/24
U.S. Cl. 526—220 **7 Claims**

1. A process for the production of toluene-soluble vulcanizable polychloroprene by emulsion polymerization of chloroprene and, based on polymerizable monomer used, 0 to 30% by weight of ethylenically unsaturated monomers copolymerizable with chloroprene in the presence of 0.05 to 1.5% by weight, based on polymerizable monomer used, of elemental sulfur or the equivalent quantity of sulfur donor using the variant of direct peptization, characterized in that the polymerization is carried out in alkaline medium in the presence of

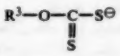
(1)—based in each case on 100 g polymerizable monomer used—as peptizing agent

(1*a*) 2×10^{-4} to 4.4×10^{-2} mol dithiocarbamate containing the anion



and/or

(1*b*) 3×10^{-4} to 6.2×10^{-2} mol xanthogenate containing the anion



in which R^1, R^2 and R^3 represent C_1–C_{24} alkyl, C_5–C_{16} cycloalkyl or C_5–C_{18} aryl, which may contain up to 3 heteroatoms, in addition to which R^1 and R^2 together represent C_4–C_5 alkylene and

(2) 0.9 to 9% by weight on 100 g polymerizable monomer and expressed as free acid of a water-soluble salt of tricyclic diterpene carboxylic acid containing two conjugated C=C double bonds per molecule in a quantity corresponding to 10^{-3} to 10^{-1} C=C double bonds per 100 g polymerizable monomer used.

4,954,586

SOFT OCULAR LENS MATERIAL

Nobuyuki Toyoshima; Takanori Shibata; Atsushi Hirashima; Ichiro Ando; Noriko Iwata, all of Nagoya; Hiroshi Yoshioka, Annaka; Akinari Itagaki, Annaka, and Toshio Yamazaki, Annaka, all of Japan, assignors to Menicon Co., Ltd, Aichi and Shin-Etsu Chemical Co., Ltd., Tokyo, both of, Japan

Filed Jan. 3, 1990, Ser. No. 460,662

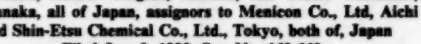
Claims priority, application Japan, Jan. 17, 1989, 1-8845; Feb. 15, 1989, 1-35218; Jul. 11, 1989, 1-178500

Int. Cl.[5] C08F *18/20*

U.S. Cl. 526—245 **11 Claims**

1. A soft ocular lens material made of a copolymer consisting essentially of:

(A) from 5 to 70 parts by weight of a fluorine-containing (meth)acrylate of the formula III:

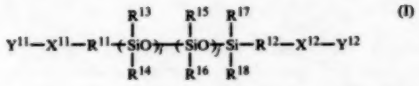


(III)

wherein R_7 represents a hydrogen atom or a methyl groups, p is an integer of form 1 to 15, q is an integer of from 1 to (2p+1), and r is an integer of from 0 to 2.

(B) from 5 to 60 parts by weight of an alkyl (meth)acrylate;

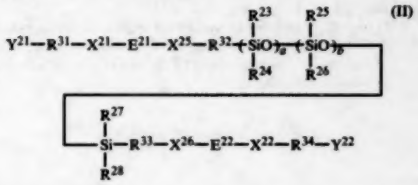
(C) from 3 to 45 parts by weight of a polysiloxane macromonomer having polymerizable groups at both terminals, of the formula I:



(I)

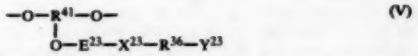
wherein each of Y^{11} and Y^{12} independently represents an acryloyl group, a methacryloyl group, a vinyl group or an allyl group; each of X^{11} and X^{12} independently represents a covalent bond, an oxygen atom or an alkylene glycol group; each of R^{11} and R^{12} independently represents a linear or branched alkylene group having from 1 to 6 carbon atoms; each of R^{13}, R^{14}, R^{15}, R^{16}, R^{17} and R^{18} independently represents an alkyl group having from 1 to 3 carbon atoms or a phenyl group; i is an integer of from 1 to 1500; and j is an integer of from 0 to 1499 (provided that i+j is at most 1500); and

(D) from 3 to 40 parts by weight of a polysiloxane macromonomer having polymerizable groups bonded via one or two urethane bonds to the siloxane main chain, of the formula II:



(II)

wherein each of Y^{21} and Y^{22} independently represents a group selected from the group consisting of an acryloyloxy group, a methacryloyloxy group, a vinyl group and an allyl group; each of R^{31} and R^{34} independently represents a linear or branched alkylene group having from 2 to 6 carbon atoms; each of X^{21} and X^{22} independently represents a covalent bond, an oxygen atom or an alkylene glycol group; each of R^{32} and R^{33} independently represents a linear or branched alkylene group having from 1 to 6 carbon atoms; each of R^{23}, R^{24}, R^{25}, R^{26}, R^{27} and R^{28} independently represents an alkyl group having from 1 to 3 carbon atoms or a phenyl group; each of E^{21} and E^{22} independently represents —NHCO— (provided that in this case, each of X^{21} and X^{22} is a covalent bond, E^{21} forms a urethane bond together with X^{25}, and E^{22} forms a urethane bond together with X^{26}) or a bivalent group derived from a diisocyanate selected from the group consisting of saturated aliphatic, alicyclic and aromatic diisocyanates (provided that in this case, X^{21} and X^{22} independently represents an oxygen atom or an alkylene glycol group, E^{21} forms a urethane bond together with X^{21} and X^{25}, and E^{22} forms a urethane bond together with $X^{22}$and X^{26}); each of X^{25} and X^{26} independently represents an oxygen atom, an alkylene glycol or a group represented by the formula V:



(V)

wherein R^{41} is a trivalent hydrocarbon group having from 1 to 6 carbon atoms; Y^{23} represents a group selected from the group consisting of an acryloyloxy group, a methacryloyloxy group, a vinyl group and a allyl group; R^{36} represents a linear or branched alkylene group having from 2 to 6 carbon atoms; X^{23} represents a covalent bond, an oxygen atom or an alkylene glycol group; E^{23} represents —NHCO— (provided that in this case, X^{23} is a covalent bond) or a bivalent group derived from a diisocyanate selected from the group consisting of saturated aliphatic, alicyclic and aromatic diisocyanates (provided that in this case, X^{23} is an oxygen atom or an alkylene glycol group), which forms a urethane bond together with X^{23} and the adjacent oxygen atom bonded to R^{41}; a is an integer of from 1 to 1500; and b is an integer of from 0 to 1499, provided $a+b\leq1500$; as essential copolymer components.

4,954,587

DIMETHYLACRYLAMIDE-COPOLYMER HYDROGELS WITH HIGH OXYGEN PERMEABILITY

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 215,101, Jul. 5, 1988, abandoned. This application May 23, 1989, Ser. No. 356,801

Int. Cl.[5] C08F *20/22*

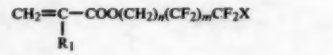
U.S. Cl. 526—245 **12 Claims**

1. A copolymer, having the characteristics of high clarity, high hydrophilicity, and high oxygen permeability and which

is, in the water swollen hydrated state, soft and flexible, which copolymer comprises the polymerization product of, with weight percent based on the total weight of monomers (a), (b), (c) and (d), of

(a) 24.9 to 70 percent by weight of N,N-dimethylacrylamide,

(b) 65 to 19.9 percent by weight of a vinyl monomer selected from the group consisting of the acrylate or methacrylate esters of formula B1



(B1)

wherein

R_1 is hydrogen or methyl,

n is an integer from 1–4,

m is an integer from 0–11,

X is hydrogen or fluorine, with the proviso that, when m is 0, X is fluorine; and hexafluoroisopropyl methacrylate,

(c) 10 to 40 percent by weight of a C_2–C_4-hydroxyalkyl acrylate or methacrylate, a C_2–C_4-alkoxy-alkyl acrylate or methacrylate or an oligosiloxanyl-silylalkyl acrylate or methacrylate containing 2 to 10 silicon atoms, or mixture thereof, and

(d) 0.1 to 3 percent by weight of a crosslinking agent having at least two copolymerizable vinyl groups.

4,954,588

FLUORINE-CONTAINING NON-CRYSTALLINE COPOLYMER

Masahiko Oka, Ohtsu; Hiroshi Uemoto, and Yasuji Iwasaki, both of Settsu, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

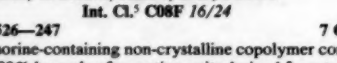
Filed Sep. 7, 1989, Ser. No. 403,867

Claims priority, application Japan, Sep. 10, 1988, 63-227185; Oct. 31, 1988, 63-275276; Mar. 7, 1989, 1-54475

Int. Cl.[5] C08F *16/24*

U.S. Cl. 526—247 **7 Claims**

1. A fluorine-containing non-crystalline copolymer comprising 10 to 90% by mole of repeating units derived from tetrafluoroethylene and 90 to 10% by mole of repeating units derived from a fluorovinyl ether of the formula:



(I)

wherein X is a halogen atom or a hydrogen atom and n is a number of 2 to 8.

4,954,589

SOLUBLE AND CURABLE FLUORINE-CONTAINING COPOLYMER SUITABLE AS PAINT VEHICLE

Kiyomi Sugawara, Kamifukuoka; Kentaro Tsutsumi, and Mikio Otani, both of Kawagoe, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 17, 1989, Ser. No. 353,032

Claims priority, application Japan, May 17, 1988, 63-118353

Int. Cl.[5] C08F *14/22*

U.S. Cl. 526—255 **9 Claims**

1. A copolymer comprising:

25 to 75 mol % of first repeating units which originate from a fluoroolefin;

10 to 70 mol % of second repeating units which originate from a fatty acid ester selected from the group consisting of vinyl esters and isopropenyl esters;

3 to 40 mol % of third repeating units which originate from a hydroxyl-containing allyl ether; and

0.1 to 20 mol % of fourth repeating units which originate from a carboxyl-containing monomer, selected from the group consisting of acrylic acid, vinylacetic acid, allyloxyacetic acid, allylacetic acid, methacrylic acid and maleic anhydride.

4,954,590

PREPARATION OF POLYMER HAVING ISOINDOLE STRUCTURES

Haruo Yoshida; Nobuo Uotani, and Yoshihiro Saida, all of Oita, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

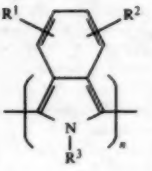
Division of Ser. No. 92,916, Aug. 6, 1987, Pat. No. 4,833,231. This application Mar. 23, 1989, Ser. No. 327,875

Claims priority, application Japan, Dec. 6, 1985, 60-273501

Int. Cl.[5] C08G *61/12*

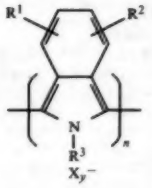
U.S. Cl. 526—259 **1 Claim**

1. A process for the preparation of a polymer having an isoindole structure containing monomer units selected from the group consisting of monomer units of the formula:



(Ia)

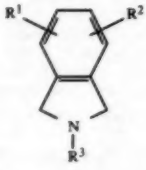
and



(Ib)

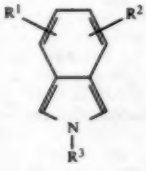
wherein R^1, R^2 and R^3 independently represent a hydrogen atom or a hydrocarbon group having 1 to 5 carbon atoms, X^- represents an anion of an electrolyte, y is a number of from 0.01 to 1, which indicates the proportion of the anion to 1 mole of the monomer, and n is a number of from 5 to 500, which indicates the degree of polymerization,

which comprises subjecting an isoindoline compound represented by the following general formula (IIa):



(IIa)

wherein R^1, R^2 and R^3 are as defined above, or an isoindole compound represented by the following general formula (IIb):



(IIb)

wherein R^1, R^2 and R^3 are as defined above, to oxidative polymerization in a solvent by the action of an oxidant.

4,954,591

ABRASION RESISTANT RADIATION CURABLE COATING FOR POLYCARBONATE ARTICLE

Hector Belmares, Petaluma, Calif., assignor to Pilkington Visioncare Holdings, Inc., Menlo Park, Calif.

Filed Nov. 6, 1987, Ser. No. 118,116
Int. Cl.[5] C08F *26/08*
U.S. Cl. 526—264 11 Claims

1. A polymerizable and cross-linkable, radiation curable coating composition for a polycarbonate article comprising a mixture of:

(a) 25–94% by weight of a polyfunctional acrylate or methacrylate monomer having at least three acrylate functional groups per molecule or a mixture of such monomers;

(b) 3–50% by weight of a monomer selected from N-vinyl derivatives of linear or cyclic secondary amides, tetrahydrofurfuryl acrylate or methacrylate, N,N-di(lower alkyl) acrylamide, ethylenically unsaturated monosilane, or a mixture of such monomers; and

(c) 3–40% by weight of an ethylenically unsaturated monomer having a Tg less than 80° C. or 3–30% of an unsaturated monomer having a Tg less than 80° C. or 3–30% of an ethylenically unsaturated copolymer with a Tg less than 100° C., said monomer and copolymer being effective to impart tintability to the coating composition after it is cured.

4,954,592

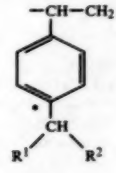
OPTICALLY ACTIVE STYRENE DERIVATIVES, POLYMERS OBTAINED FROM THESE, COMPLEXES WITH IRIDIUM(I) AND THEIR USE

Jürgen Kaschig, Freiburg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

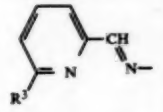
Division of Ser. No. 258,368, Oct. 17, 1988, Pat. No. 4,891,412, which is a division of Ser. No. 47,099, May 8, 1987, Pat. No. 4,800,224. This application Oct. 11, 1989, Ser. No. 419,792
Claims priority, application Switzerland, May 16, 1986, 1985/86
Int. Cl.[5] C08F *26/06*; C08C *19/42*
U.S. Cl. 526—265 2 Claims

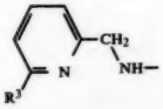
1. A homopolymer or copolymer having optically active side groups and containing, relative to the polymers

(a) 0.005 to 100 mol% of at least one repeating structural element of the formula VII

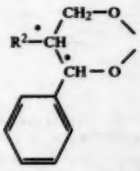

(VII)

in which R^1 is C_1–C_4-alkyl, phenyl or benzyl, R^2 is a radical if the formula II or IIa


(II)

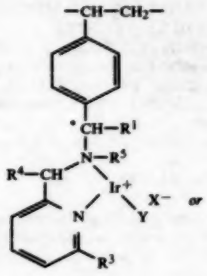

(IIa)

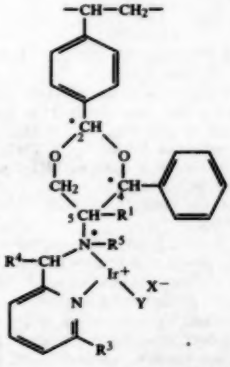
in which R^3 is H or —CH_3, or R^1 and R^2 together form a radical of the formula



in which R^2 has the meaning given above; and * represents predominantly R or predominantly S configuration, and

(b) 99.995 to 0 mol % of at least one structural element which is derived from an olefinic comonomer and differs from (a), wherein at least some of the structural elements of the formula VII are complexed with iridium(I) and correspond to the formula IX and X


(IX)


(X)

in which R^1 and R^3 re as defined above, R^4 and R^5 are each H or together form a bond $X^{\ominus}$ is an anion of a monobasic inorganic or organic acid and Y is an open-chain or cyclic diene having 6 to 10 C atom wherein each double is separated by 1 or 2 C atoms.

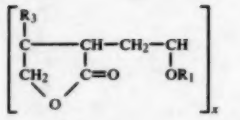
4,954,593

FURANONE/VINYL ETHER COPOLYMERS

Fulvio J. Vara, Chester; James A. Dougherty, Pequannock, both of N.J., and Jeffrey S. Plotkin, Monsey, N.Y., assignors to GAF Chemical Corporation, Wayne, N.J.

Filed Aug. 18, 1989, Ser. No. 395,687
Int. Cl.[5] C08F *234/02*
U.S. Cl. 526—270 11 Claims

1. The copolymer having the formula



wherein R_3 is lower alkyl or hydrogen; x is an integer having a value of from 100 to 150,000; R_1 is a saturated radical or a radical having a terminal vinyl group and is selected from the group consisting of alkoxylated vinyl; alkoxylated alkanol; alkyl optionally substituted with one or more vinyl ether, alkylate, hydroxy or alkoxylated vinyl groups, phenyl optionally substituted with one or more lower alkyl, hydroxy, alkylene alkoxylate or alkoxylated vinyl groups and a functional derivative of the radicals when R_1 contains a functional vinyl group.

4,954,594

COPOLYMERS OF ETHYLENE AND METHOXYACETIC ACID VINYL ESTER

Wolfgang Payer, Wesel; Heinz D. Bühnea, and Wilhelm Zoller, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 248,549, Sep. 23, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,235

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732721

Int. Cl.[5] C08F *18/04*

U.S. Cl. 526—320 **3 Claims**

1. A copolymer comprising 95 to 50 percent by weight ethylene and 5 to 50 percent by weight methoxyacetic acid vinyl ester having an average molecular mass (M_n) of 500 to 10,000 g x mol^{-1}.

4,954,595

METHOD FOR PREPARING VINYL CHLORIDE POLYMERS

Tadashi Amano, Hazaki, and Shigehiro Hoshida, Kamisu, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Sep. 6, 1988, Ser. No. 240,734

Claims priority, application Japan, Sep. 8, 1987, 62-224763; Dec. 28, 1987, 62-335422; Jan. 8, 1988, 63-2345; Apr. 27, 1988, 63-104892; May 19, 1988, 63-123227

Int. Cl.[5] C08F *14/06, 2/20*

U.S. Cl. 526—344.2 **8 Claims**

1. A method for preparing vinyl chloride polymers which comprises suspension polymerizing vinyl chloride monomer or a vinylic monomer mixture composed or vinyl chloride in an aqueous medium in the presence of a polymerization initiator, characterized by washing a piping and an opening of a polymerizer for charging the polymerization initiator into the polymerizer, with hot water heated to not less than 90° C. at which the half-life of the polymerization initiator is not more than about one hour, after introducing the initiator into the polymerizer.

4,954,596

PROCESS FOR MANUFACTURING ORGANIC SILAZANE POLYMERS AND CERAMICS THEREFROM

Yoshifumi Takeda; Minoru Takamizawa, and Tsutomu Takeno, all of Kubikimura, Japan, assignors to Shin-Etsu Chemical Col, Ltd., Tokyo, Japan

Filed Dec. 12, 1988, Ser. No. 283,316

Claims priority, application Japan, Dec. 11, 1987, 62-313264

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—14 **10 Claims**

1. A method for manufacturing organic silazane polymers comprising:

forming a mixture consisting essentially of 20 to 90 mol. % of at least one organosilicic compound having the formula:

(I)

in which R is the same or different and represents a methyl group, an ethyl group or a phenyl group, and X represents a chlorine or a bromine atoms;

and 80 to 10 mol. % of at least one organosilicic compound having the formula:

(II)

in which R represents a methyl group, an ethyl group or a phenyl group, R_1 represents a hydrogen atom or a vinyl group and X represents a chlorine or a bromine atom;

reacting this mixture with ammonia to produce silazane compounds; and

polymerizing the silazane compounds in the presence of an alkali metal hydroxide catalyst to obtain organic silazane polymers.

4,954,597

METHYLHYDROSILOXANE PAPER COATINGS

Anthony Revis, Saginaw County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 392,320, Aug. 11, 1989. This application Oct. 10, 1989, Ser. No. 418,596

Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—15 **11 Claims**

1. A process of preparing a paper coating film from a cured and cross-linked methylhydrosiloxane comprising contacting and forming a mixture of an allyl ester with at least one methylhydrosiloxane in the presence of a Group VIII metal catalyst, coating the mixture on a paper substrate, and heating the mixture of the allyl ester, the methylhydrosiloxane, the Group VIII metal catalyst, and the substrate, in the presence of ambient moisture until the methylhydrosiloxane becomes cured and cross-linked.

4,954,598

FAST-CURE POLYURETHANE SEALANT COMPOSITION CONTAINING SILYL-SUBSTITUTED GUANIDINE ACCELERATORS

Jamil Baghdachi, Northville, and Keith H. Mahoney, Grosse Pointe City, both of Mich., assignors to BASF Corporation, Clifton, N.J.

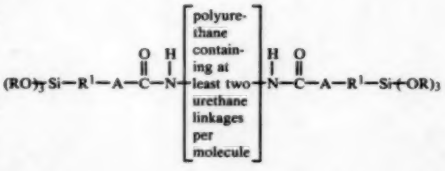
Filed Oct. 13, 1988, Ser. No. 257,486

Int. Cl.[5] C08G *77/08*

U.S. Cl. 528—22 **16 Claims**

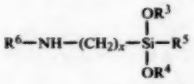
1. A one-component, moisture-curable sealant composition comprising a mixture of

(a) a silane-terminated polyurethane polymer of the formula



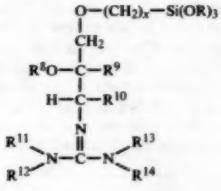
wherein
R is lower alkyl of from 1 to 6 carbon atoms;
R^1 is a divalent bridging radical selected from the group consisting of a divalent hydrocarbon radical, a divalent hydrocarbon ether radical, and a divalent hydrocarbon amino radical;
A is selected from the group consisting of —S— and —NR^2— where R^2 is hydrogen or alkyl of from one to six carbon atoms;

(b) from 0.2 to 1.0 parts by weight of an aminosilane per 100 parts by weight of said silane-terminated polyurethane polymer, said aminosilane having the structure

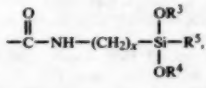


wherein
x is an integer of from one to three;
R^3 and R^4 may be the same or different and are selected from alkyl of from one to four carbon atoms;
R^5 is alkyl of from one to four carbon atoms or alkoxyl of from one to four carbon atoms;
R^6 is hydrogen or $-(CH_2)_yNHR^7$ wherein R^7 is hydrogen or 13 $(CH_2)_zNH_2$ and wherein y and z may be the same or different and are integers of from one to three;

(c) from 0.2 to 1.0 parts by weight of an accelerator per 100 parts by weight of said silane-terminated polyurethane polymer, said accelerator selected from the group consisting of compounds or mixtures thereof having the structure



where x and R are as previously defined; R^8, is hydrogen or



where R^3, R^4, R^5, and x are as defined above;
R^9 and R^{10} are hydrogen or, when taken together with the carbon atoms to which they are attached, form a saturated six-membered carbocyclic ring; and
R^{11}, R^{12}, R^{13}, and R^{14} are independently hydrogen or alkyl of from one to four carbon atoms.

4,954,599

FORMED, POLYMERIC, TERTIARY OR SECONDARY ORGANOSILOXANE AMINE COMPOUNDS, METHODS OF THEIR PREPARATION AND USE

Peter Panster, Rodenback, and Peter Kleinschmit, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

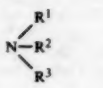
Filed Jan. 11, 1989, Ser. No. 295,886

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800563

Int. Cl.[5] **C08G** *77/26*

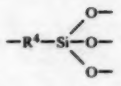
U.S. Cl. 528—38 **21 Claims**

1. A spherically formed, polymeric, tertiary or secondary organosiloxane amine compound containing recurring units of the formula:



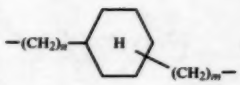
(I)

in which R^1 and R^2 are identical or different and represent a group of the formula:

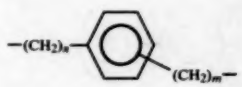


(II)

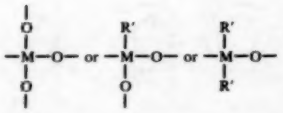
in which formulae the nitrogen atoms in (I) are connected to the silicon atoms in (II) via the R^4 groups and
R^4 represents an alkylene group with 1 to 10 C atoms, a cycloalkylene group with 5 to 8 C atoms or a unit of the general formula:



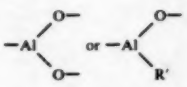
or



in which n is a number from 1 to 6 and indicates the number of methylene groups in nitrogen position
and m is a number from 0 to 6
and the free valences of the oxygen atoms bound to the silicon atom are attached either to
(a) silicon atoms of other groups of formula (II) or to
(b) metal atoms of one or more of the cross-linking binding links



or



or a combination of (a) and (b)
in which M is a silicon, titanium or zirconium atom and R' a linear or branched alkyl group with 1 to 5 C atoms and the ratio of the silicon atoms of the groups of general formula (II) to the metal atoms in the binding links is 1:0 to 1:10
and in which R^3 is equal to R^1 or R^2 or hydrogen,
or a linear or branched alkyl of 1 to 10 C atoms, a cycloalkyl of 5 to 8 C atoms or is benzyl, wherein the said compound is in the form of macroscopically spherical particles with a diameter of 0.01 to 3.0 mm, a specific surface area of up to 1000 m^2/g, a specific pore volume of 0 to 6.0 ml/g as well as by a bulk density of 50 to 1000 g/l.

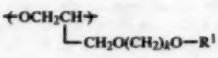
4,954,600

FERROELECTRIC LIQUID-CRYSTALLINE POLYMER AND EPOXIDE USABLE TO PREPARATION OF THE FERROELECTRIC LIQUID-CRYSTALLINE POLYMER

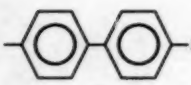
Satoshi Hachiya, Chiba, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

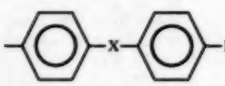
Filed Jun. 16, 1989, Ser. No. 367,252
Claims priority, application Japan, Jun. 27, 1988, 63-156789; Apr. 27, 1989, 1-105788
Int. Cl.[5] C08G 65/22; C09K 19/52
U.S. Cl. 528—89 6 Claims

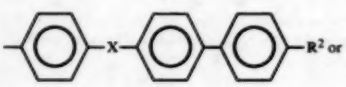
1. A ferroelectric liquid-crystalline polymer consisting essentially of at least one repeating unit represented by the following general formula:

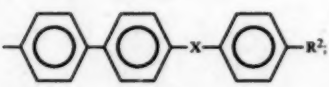


wherein
k is an integer having a value of 2 to 30;
R^1 is

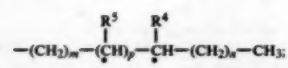








X is —COO— or —OCO—; and
R^2 is —$COOR^3$, —$OCOR^3$ or —OR^3;
wherein
R^3 is



wherein
each of R^4 and R^5 is independently —CH_3, a halogen atom or —CN;
each of m and n is independently an integer having a value of 0 to 10, with the proviso that when R^4 is —CH_3, n is not an integer having a value of 0;
p is an integer having a value of 0 or 1; and
C marked with • is an asymmetric carbon atom.

4,954,601

POLYIMIDE PRECURSORS AND METHOD FOR PREPARING CROSSLINKED POLYIMIDES USING SAID PRECURSORS

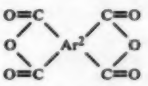
Russell K. King, Beaver, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 3, 1989, Ser. No. 293,153
Int. Cl.[5] C08G 18/80, 73/06, 73/10
U.S. Cl. 528—45 8 Claims

1. In a heat curable polyimide precursor comprising
A. a polyamic acid prepared by reacting at least one aromatic diamine represented by the formula

$H_2NAr^1NH_2$

with at least one aromatic tetracarboxylic acid dianhydride, represented by the formula



where Ar^1 represents a divalent aromatic hydrocarbon radical, Ar^2 represents a tetravalent aromatic hydrocarbon radical, and the carbon atoms of each of the two anhydride groups are bonded to adjacent carbon atoms of an aromatic ring structure, and
B. a blocked polyfunctional isocyanate in an amount sufficient to cure said precursor,
the improvement comprising (1) the presence of said polyamic acid as an oligomer containing an average of from 2 to 30 repeating units per molecule, no =C—O—C= groups in Ar^1 or Ar^2 and terminal groups of the formula —C(O)OC(O)—, where the free valences of said terminal groups are bonded to adjacent carbon atoms of an aromatic ring structure. (2) a molar ratio of blocked isocyanate to said terminal groups, of 1:1, and (3) a decomposition temperature of said blocked isocyanate that is above the lowest temperature at which said oligomer will convert to a thermoplastic polyimide.

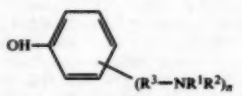
4,954,602

LIQUID, EPOXY RESIN COMPOSITION

Ichiro Akutagawa, Nagareyama; Tsutomu Yamaguchi; Toshihiro Hanamori, both of Saitama; Kunimitsu Matsuzaki, Yono, and Shinobu Okamura, Shimada, all of Japan, assignors to Somar Corporation, Japan

Filed Jun. 23, 1989, Ser. No. 369,998
Claims priority, application Japan, Jun. 24, 1988, 63-154889
Int. Cl.[5] C08G 59/24, 59/68
U.S. Cl. 528—93 14 Claims

1. A liquid, epoxy resin composition comprising:
(A) a mixture containing
(a_1) a Bisphenol A epoxy resin, and
(a_2) an alicyclic epoxy resin; and
(B) a curing agent including
(b_1) an acid anhydride, and
(b_2) a phenol compound of the general formula:



wherein R^1 and R^2 represent independently from each other a lower alkyl, R^3 represents a lower alkylene and n is an integer of 1-5, the amount of said phenol compound being 2-8% based on the weight of the mixture (A).

4,954,603
EPOXY RESIN

Toshimasa Takata, Ichihara; and Kenichi Mizuno, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

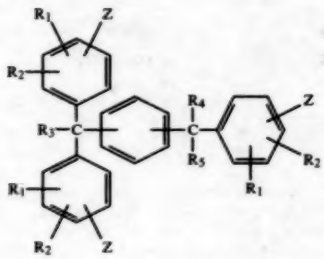
Continuation-in-part of Ser. No. 30,340, Mar. 26, 1987, abandoned, and a continuation-in-part of Ser. No. 227,773, Aug. 3, 1988, Pat. No. 4,894,432, which is a division of Ser. No. 916,099, Oct. 7, 1986, Pat. No. 4,778,936. This application Jun. 6, 1989, Ser. No. 362,289

Claims priority, application Japan, Oct. 8, 1985, 60-224305; Dec. 20, 1985, 60-237288

Int. Cl.[5] C08G *59/24*; C07D *303/12*

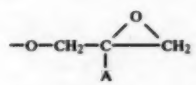
U.S. Cl. 528—98 15 Claims

1. A heat-resistant flame-retardant epoxy resin composition comprising a halogen-containing epoxy resin obtained by reacting (A) a trifunctional epoxy compound represented by the following general formula (I):



(I)

wherein R_1 and R_2 stand for a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an aryl group or a cycloalkyl group having 3 to 6 carbon atoms, R_3 stands for a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R_4 and R_5, independently, stand for a hydrogen atom or an alkyl group having 1 to 4 carbon atoms and Z stands for a group represented by the following general formula (II):



(II)

in which A stands for a hydrogen atom or a methyl group, or a combination of said trifunctional epoxy compound and a difunctional epoxy compound obtained by condensation of a bisphenol with an epihalohydrin with (B) a halogenated bisphenol in the presence of a catalyst.

4,954,604
PROCESS FOR THE PRODUCTION OF AROMATIC POLYETHER KETONES

Joachim Genz; Hans-Rudolf Dicke; Volker Eckhardt, all of Krefeld, and Frank Kleiner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1988, Ser. No. 238,406

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730690

Int. Cl.[5] C08C *8/02, 8/14*

U.S. Cl. 528—125 4 Claims

1. A process for the production of a high molecular weight, crystalline, aromatic polyether ketone from an aromatic dihydroxy compound and an aromatic dihalogen compound containing a keto group in the presence of alkali salts, characterized in that N—C_1—C_5—alkyl caprolactams are used as the solvent.

4,954,605
AROMATIC POLYETHERKETONE FIBER PRODUCT

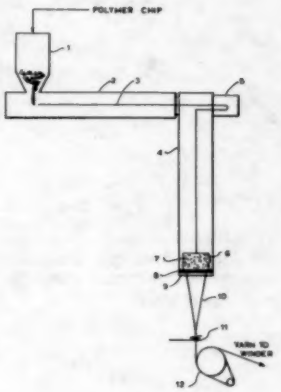
Martin H. G. Deeg, Maplewood, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 107,845, Oct. 6, 1987, Pat. No. 4,849,148, which is a continuation of Ser. No. 732,537, May 10, 1985, abandoned. This application Mar. 31, 1989, Ser. No. 332,532

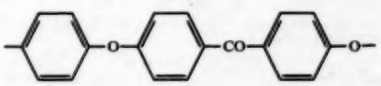
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] C08G *8/02, 65/38*; D02G *3/00*; D01F *1/00*

U.S. Cl. 528—125 3 Claims



1. Multifilament and yarns of a polymer having an inherent viscosity of at least 0.7 measured in concentrated sulfuric acid, said polymer containing in the polymer chain at lease 50 percent of the repeating units:



said fibers and yarns having at least ten filaments and a dpf of about 15 to 100, a tenacity of about 1 to 2 grams per denier, an elongation at break of about 50 to 160 percent, and a modulus of about 20 to 30 grams per denier.

4,954,606
SOLID PHASE POST POLYMERIZATION CONDENSATION OF THERMOTROPIC POLYESTER IMIDES

Hans-Rudolf Dicke, Bestwig; Joachim Genz, Krefeld; Volker Eckhardt, Krefeld, and Ludwig Bottenbruch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

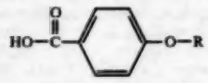
Filed Oct. 19, 1988, Ser. No. 259,768

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1987, 3737067

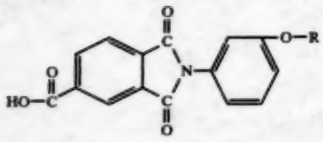
Int. Cl.[5] C08G *73/16*

U.S. Cl. 528—170 1 Claim

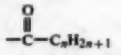
1. A process for preparing polyester imides comprising the solid phase after-condensation of polyester imides prepared by reacting a compound of the formula,

(A)


with a compound of the formula,

(B)


wherein R is hydrogen,



or —Ar, n=1 or 3 and Ar is phenyl or tolyl, optionally in the presence of catalysts, chain breaking agents, branching agents, or mixtures thereof at temperatures from 150° to 380° C., optionally at reduced pressure.

4,954,607

FERROMAGNETIC ORGANIC SUBSTANCE HAVING TRIARYL METHANE STRUCTURE AND PROCESS FOR MANUFACTURING THE SAME

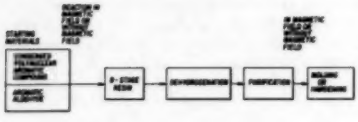
Sugio Otani; Akira Kojima, both of Kiryu, and Michiya Ota, Maebashi, all of Japan, assignors to Gunma University, Maebashi, Japan

Filed Aug. 15, 1989, Ser. No. 393,775

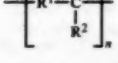
Claims priority, application Japan, Aug. 25, 1988, 63-209522; Mar. 28, 1989, 1-74097

Int. Cl.[5] C08G 4/00

U.S. Cl. 528—230 **15 Claims**



1. A ferromagnetic organic substance having a triaryl methane structure which comprises a triaryl methane basic structural unit represented by the general formula,



wherein R^1 is a substituted or non-substituted, condensed polynuclear arylene group comprising at least two aromatic rings which, however, can contain a hetero atom including N, S or O as a ring member, or a phenylene group substituted with an electron donating group, R^2 is a substituted or non-substituted aryl group, and n is an integer of at least 3, and which is characterized in that a free radical concentration of methine carbon positions is at least 10^{17} radicals/g.

4,954,608

COPOLYMERIZED POLYAMIC ACID SALTS AND PROCESS OF PRODUCING THEM

Masakazu Uekita, and Hiroshi Awaji, both of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki, Osaka, Japan

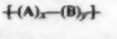
Filed Jun. 1, 1987, Ser. No. 55,973

Claims priority, application Japan, May 30, 1986, 61-126575; Jun. 20, 1986, 61-145718

Int. Cl.[5] C08G 73/10, 69/26, 69/32

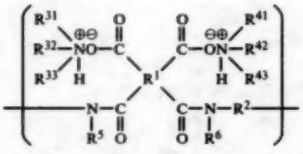
U.S. Cl. 528—350 **23 Claims**

1. A copolymerized polyamic acid salt having a recurring unit represented by formula

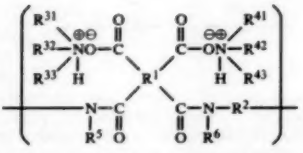


(I)

wherein (A) represents a formula

(1)


wherein, R^1 represents a tetravalent group having at least 2 carbon atoms; R^2 represents a divalent group having at least 2 carbon atoms; and R^{31}, R^{32}, R^{33}, R^{41}, R^{42}, R^{43}, R^5, and R^6 each represents a monovalent group having 1 to 30 carbon atoms selected from an aliphatic group, an alicyclic group, an aromatic group, a group in which an aliphatic group is combined with an alicyclic group or an aromatic group, each of these groups substituted by a halogen atom, a nitro group, an amino group, a cyano group, a methoxy group, or an acetoxy group, or a hydrogen atom; at least one of said R^{31}, R^{32}, R^{33}, R^{41}, R^{42}, R^{43}, R^5 and R^6 do not take a group having 1 to 11 carbon atoms or a hydrogen atom; and (B) represents one or more formula

(1)


wherein R^1, R^2, R^{31}, R^{32}, R^{33}, R^{41}, R^{42}, R^{43}, R^5 and R^6 are as defined in (A) except that at least one of said R^1, R^2, R^{31}, R^{32}, R^{33}, R^{41}, R^{42}, R^{43}, R^5 and R^6 do not take the same group as defined in (A); and x and y represent a ratio which satisfies $0<x<1$, $0<y<1$ and $x+y=1$.

4,954,609

INTERMEDIATE MOLECULAR WEIGHT FLUORINE CONTAINING POLYMIDE AND METHOD FOR PREPARATION

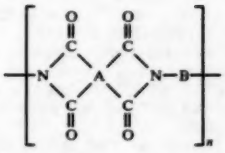
Rohitkumar H. Vora, Westfield, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Feb. 28, 1989, Ser. No. 317,169

Int. Cl.[5] C08G 73/10

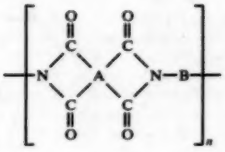
U.S. Cl. 528—353 **12 Claims**

1. A process for producing a polyimide polymer having recurring groups of the structure:



wherein the moiety A is a tetravalent aromatic radical containing at least one benzene, naphthalene or poly-phenyl nucleus, the moiety B is a divalent aromatic group, and n is an integer ranging from about 100 to about 200, comprising:

(a) forming a dispersion of an approximately equimolar mixture of an aromatic diamine monomer and an aromatic dianhydride monomer in organic solvent at the monomer solid level within the range of from about 8 to about 12% by weight, at least one of said monomers containing a



group linking two aromatic moieties, wherein R is CF_3 or phenyl;

(b) subjecting said monomer mixture to isothermal polymerization conditions in the absence of a monomer end capping agent to form a polyamic acid; and

(c) cyclizing said polyamic acid to form a polyimide;

said polymerization step being of sufficient length of time and uniformity of temperature to achieve a polyamide having a weight average molecular weight within the range of about 80,000 to about 135,000, an inherent viscosity within the range of from about 0.45 to about 0.70 as measured from a solution of the polymer in dimethyl acetamide at 25° C. at a polymer concentration of 0.5 weight percent, and a polydispersity within the range of from about 1.7 to about 2.6.

4,954,610

POLYAMIDE-IMIDE POLYMERS HAVING FLUORINE-CONTAINING LINKING GROUPS

Paul N. Chen, Sr., Morris, and Rohitkumar H. Vora, Westfield, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

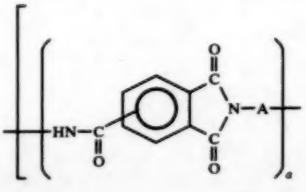
Filed Feb. 27, 1989, Ser. No. 316,380

The portion of the term of this patent subsequent to May 27, 1989, has been disclaimed.

Int. Cl.[5] C08G *69/26, 69/28*

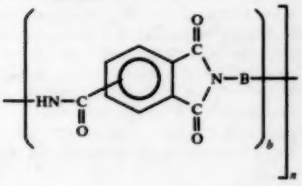
U.S. Cl. 528—350 **13 Claims**

1. A polyamide-imide polymer containing at least one recurring structural unit of the formula:



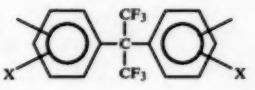
(I)

-continued

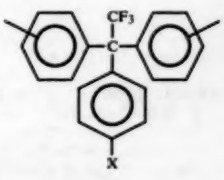


wherein the terms (a) and (b) are equal to the mole fraction of each recurring unit in the polymer chain and (a) ranges from about 0.0 to about 0.95, (b) ranges from about 1.00 to about 0.05, with the proviso that the sum of (a) and (b) is equal to 1.00, n is a number sufficient to give rise to a polyamide-imide inherent viscosity of at least about 0.05 as measured from a solution of the polymer in dimethylacetamide at 25° C. at a polymer concentration of 0.5 weight percent;

A is a divalent aromatic moiety, and B is a divalent aromatic moiety containing the ring substituted or ring unsubstituted residuum selected from:



or



wherein x is a non-interfering monovalent substituent selected from the group consisting of hydrogen, chloro, fluoro, lower alkyl or alkoxy having 1 to 6 carbon atoms, hydroxy and phenyl.

4,954,611

SHAPED ARTICLES FROM POLYAMIDE-IMIDE POLYMERS HAVING FLUORINE CONTAINING LINKING GROUPS

Paul N. Chen, Sr., Gillette, and Rohitkumar H. Vora, Westfield, both of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

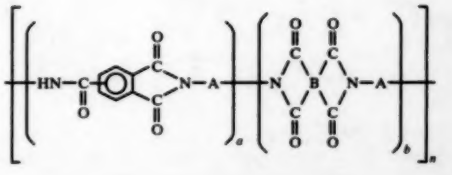
Filed Feb. 27, 1989, Ser. No. 316,342

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

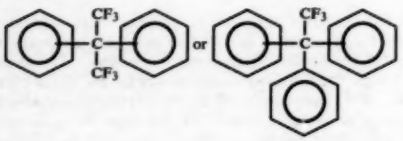
Int. Cl.[5] C08G *69/26, 69/28*

U.S. Cl. 528—353 **15 Claims**

1. A shaped article prepared by heat processing a polyamide-imide polymer composition containing at least one recurring structural unit of the formula:



wherein the terms (a) and (b) are equal to the mole fraction of each recurring unit in the polymer chain and (a) ranges from about 0.05 to about 0.95, (b) ranges from about 0.05 to about 0.95, with the proviso that the sum of (a) and (b) is equal to 1, n is a number sufficient to give rise to a polyamide-imide inherent viscosity of at least about 0.1 as measured from a solution of the polymer in dimethylacetamide at 25° C. at a polymer concentration of 0.5 weight percent, A is a divalent aromatic moiety, and B is a tetravalent aromatic moiety containing the ring substituted or ring unsubstituted residuum selected from:



4,954,612

SOLVENT-SOLUBLE POLYIMIDE AND PRODUCTION THEREOF

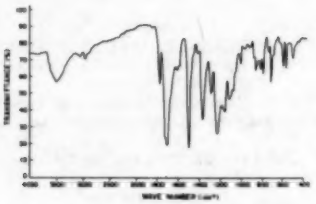
Yoshihiro Nomura; Kazuhito Hanabusa; Hiroshi Minamisawa, all of Ichihara; Takashi Morinaga, Chiba; Toichi Sakata, Katsuta; Yoshiyuki Mukoyama, Hitachi; Hiroshi Nishizawa, Kitaibaraki, and Hiromu Miyajima, Ichihara, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1989, Ser. No. 309,878

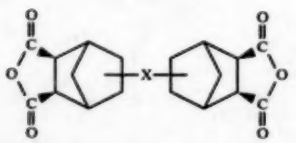
Claims priority, application Japan, Feb. 15, 1988, 63-32360

Int. Cl.[5] C08G *69/12, 69/26, 75/00, 79/02*

U.S. Cl. 528—353 **13 Claims**



1. A solvent-soluble polyimide obtained by reacting an exo-form dicarboxylic acid anhydride represented by the formula:



wherein X is S or SO_2, with an aromatic diamine in a polar solvent, followed by dehydration ring closure.

4,954,613

CATALYTIC PREPARATION OF POLYCARBONATE FROM DIALKYL CARBONATE AND BIS PHENOL DICARBOXYLATE

Barry Hudson, Beverley, United Kingdom, assignor to BP Chemicals Limited, London, England

PCT No. PCT/GB88/00568, § 371 Date Mar. 7, 1989, § 102(e) Date Mar. 7, 1989, PCT Pub. No. WO89/00590, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 14, 1988, Ser. No. 326,568

Claims priority, application United Kingdom, Jul. 15, 1987, 8716675

Int. Cl.[5] C08G *64/30*

U.S. Cl. 528—371 **6 Claims**

1. An integrated process for producing polycarbonates, said process comprising:

A. reacting in a transesterification reaction a dialkyl carbonate with a bisphenol dicarboxylate in contact with a catalyst to form a carbonate oligomer and an alkyl ester, and separating the alkyl ester from the oligomer;

B. carbonylating the alkyl ester from step A with carbon monoxide in the presence of a carbonylation catalyst to form a product comprising an anhydride;

C. reacting the product comprising the anhydride from step B with a bisphenol to form the bisphenol diester, and recycling the diester to step A; and

D. heating the oligomer from step A in contact with a catalyst to form the polycarbonate.

4,954,614

PROCESS FOR MINIMIZING RESIDUAL HYDRAZINE IN POLYMER LATICES

Henry W. Schiessl, Northford, and Steven A. Manke, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed May 11, 1989, Ser. No. 350,653

Int. Cl.[5] C08F *6/10, 6/16, 6/24*

U.S. Cl. 528—483 **10 Claims**

1. A process for reducing or eliminating hydrazine from a mixture of hydrazine and polymer, wherein said polymer is in latex form, which comprises contacting said hydrazine in said mixture with an oxygen-containing gas which is air or oxygen at an elevated pressure and a temperature of between about 20° C. and about 100° C. in the presence of a quinone or hydroquinone catalyst in order to effect a reaction of said hydrazine with said oxygen-containing gas in order to produce a purified mixture containing a reduced amount of hydrazine.

4,954,615

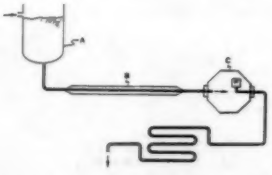
PROCESS FOR DRYING CARBOXYL CONTAINING POLYMERS OF VINYLIDENE MONOMERS

Jong S. Kim, Seongnam; Ki T. Lee, and Dong B. Shu, both of Pohang, all of Rep. of Korea, assignors to Korea Steel Chemical Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 17, 1988, Ser. No. 208,414

Int. Cl.[5] C08F *6/24*

U.S. Cl. 528—501 **21 Claims**



1. A process for drying a slurry mixture comprising a carboxyl containing polymer of vinylidene monomers having at

least one terminal methylene group and polymerizing solvent which comprises:

(1) passing said slurry mixture through one or a plurality of jacketed and preheated tubular heat exchangers arranged in parallel by employing a transfer means obtained by applying to said slurry mixture a pressure ranging from 0.5 Kg/cm^2 to 5 Kg/cm^2, wherein each of said jacketed tubular heat exchangers has an inner diameter ranging from $\frac{1}{2}$" to $1\frac{1}{4}$" and a length in excess of 20 meters and is heated at a temperature at or slightly above the glassification temperature (Tg) of said polymer in order to produce turbulent flow of a two-phase mixture of said polymer in a pulverized state and said solvent in a vaporized state; and, thereafter,

(2) feeding said two-phase mixture to a rotary vacuum dryer wherein the pulverized polymer is further dried and the vaporized solvent is recovered through a filtering means.

4,954,616

USE OF GUANIDINE-RELATED COMPOUNDS COMPRISING A SUBSTITUTED TETRAPHENYLBORATE ION IN SOLUTION PHASE PIPTIDE SYNTHESIS

Roland Callens, Gent-Drongen, and André Collin, Ligny, both of, Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Jun. 17, 1988, Ser. No. 207,877

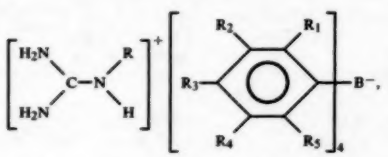
Claims priority, application France, Jun. 19, 1987, 87 08696

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Int. Cl.[5] C07K *1/02*

U.S. Cl. 530—333 **4 Claims**

1. Use of a guanidine-related compound in solution phase peptide synthesis, the guanidine-related compounds comprising a tetraphenylborate ion and having the general formula:



wherein R denotes an organic radical comprising at least one amine group, and R_1, R_2, R_3, R_4 and R_5 denote inorganic or organic groups independently of each other.

4,954,617

MONOCLONAL ANTIBODIES TO FC RECEPTORS FOR IMMUNOGLOBULIN G ON HUMAN MONONUCLEAR PHAGOCYTES

Michael W. Fanger, Lebanon; Paul M. Guyre, Hanover, both of N.H., and Clark L. Anderson, Columbus, Ohio, assignors to Trustees of Dartmouth College, Hanover, N.H.

Continuation-in-part of Ser. No. 882,181, Jul. 7, 1986, abandoned. This application Jul. 1, 1987, Ser. No. 69,412

Int. Cl.[5] A61K *39/395*; C07K *15/14*; C12N *5/00*

U.S. Cl. 530—387 **8 Claims**

1. A monoclonal antibody which binds, through its antigen binding region, specifically to the 72 K.D. affinity Fc receptor for IgG on human monocytes, the antibody binding site on the receptor being distinct from the ligand binding site for Fc and binding not being blocked by human IgG.

4,954,618

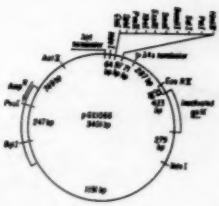
CLONED STREPTOCOCCAL GENES ENCODING PROTEIN G AND THEIR USE TO CONSTRUCT RECOMBINANT MICROORGANISMS TO PRODUCE PROTEIN G

Stephen R. Fahnestock, Olney, Md., assignor to Genex Corporation, Gaithersburg, Md.

Division of Ser. No. 63,959, Jun. 19, 1987, which is a continuation-in-part of Ser. No. 329, Feb. 17, 1987, which is a continuation-in-part of Ser. No. 854,887, Apr. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 829,354, Feb. 14, 1986, abandoned. This application Mar. 15, 1989, Ser. No. 280,963

Int. Cl.[5] C07K *3/00*; C08H *1/00*; C12N *15/00*

U.S. Cl. 530—387 **6 Claims**



1. A protein having the immunoglobulin binding specificity of protein G having the formula:

$$-(-B-b-)_n-$$

wherein B is B1, B2, or B3,

n is 1–20, B1is the immunoglobulin binding sequence;

THR TYR LYS LEU ILE LEU ASN GLY LYS THR
ACT TAC AAA TTA ATC CTT AAT GGT AAA ACA
B1

LEU LYS
TTG AAA 1294

240
GLY GLU THR THR THR GLU ALA VAL ASP ALA
GGC GAA ACA ACT ACT GAA GCT GTT GAT GCT
B1

250
ALA THR ALA
GCT ACT GCA 1333

260
GLU LYS VAL PHE LYS GLN TYR ALA ASN ASP
GAA AAA GTC TTC AAA CAA TAC GCT AAC GAC
B1

ASN GLY VAL
AAC GGT GTT 1372

270
ASP GLY GLU TRP THR TYR ASP ASP ALA THR
GAC GGT GAA TGG ACT TAC GAC GAT GCG ACT
B1

LYS THR PHE
AAG ACC TTT 1411

280
THR VAL THR GLU
ACA GTT ACT GAA
B1

B2 is the immunoglobulin binding sequence:

THR TYR LYS LEU VAL ILE ASN
ACT TAC AAA CTT GTT ATT AAT 1489
B2

310
GLY LYS THR LEU LYS GLY GLU THR THR THR
GGT AAA ACA TTG AAA GGC GAA ACA ACT ACT
B2

LYS ALA VAL
AAA GCA GTA 1528

320
ASP ALA GLU THR ALA GLU LYS ALA PHE LYS
GAC GCA GAA ACT GCA GAA AAA GCC TTC AAA
B2

330
GLN TYR ALA
CAA TAC GCT 1567

340
ASN ASP ASN GLY VAL ASP GLY VAL TRP THR
AAC GAC AAC GGT GTT GAT GGT GTT TGG ACT
B2

TYR ASP ASP
TAT GAT GAT 1606

350
ALA THR LYS THR PHE THR VAL THR GLU
GCG ACT AAG ACC TTT ACG GTA ACT GAA
B2

B3 is a 55 amino acid hybrid sequence of B1 and B2, wherein the first N amino acids correspond to the first N amino acids of B1 or B2 and the last 55-N amino acids correspond to the last 55-N amino acids of B2 or B1, respectively; and

b is the amino sequence:

290
LYS PRO GLU VAL ILE ASP ALA SER GLU
AAA CCA GAA GTG ATC GAT GCG TCT GAA 1450
b

LEU THR PRO ALA VAL THR
TTA ACA CCA GCC GTG ACA
b

with the proviso that the amino acid sequence of said protein is not the same as the amino acid sequence of wild type protein G or a fragment thereof.

4,954,619

O-BENZYL-N-HYDROXYALKYL DERIVATIVES OF CHITOSAN AND NAIL POLISH CONTAINING THE SAME

Günther Lang, Reinheim; Gerhard Maresch, and Hans-Rudi Lenz, both of Darmstadt, all ofr, Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,763

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723811

Int. Cl.[5] **C08B** *37/00*; **A61K** *7/00*

U.S. Cl. 536—20 **15 Claims**

1. Nail polish based upon a film-former, a resin component and a solvent system, comprising as film-former or resin component an O-benzyl-N-hydroxyalkyl-chitosan of the formula (I)

$$HO\{C_6H_{11-m-q}NO_4(R^1)_m(R^2)_n(R^3)_q\}_pH \quad (I),$$

wherein

m is any numerical value from 0 to 0.6,

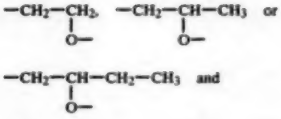
n is any numerical value from 0.1 to 10 and

q is any numerical value from 0.1 to 4,

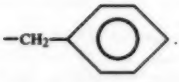
p is an integer from 50 to 5,000,

R^1 is

R^2 is



R^3 is



12. An O-benzyl-N-hydroxyalkyl chitosan of the formula (I)

$$HO\{C_6H_{11-m-q}NO_4(R^1)_m(R^2)_n(R^3)_q\}_pH \quad (I),$$

wherein

m is any numerical value from 0 to 0.6,

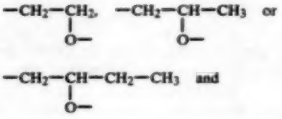
n is any numerical value from 0.1 to 10 and

q is any numerical value from 0.1 to 4,

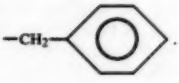
p is an integer from 50 to 5,000,

R^1 is

R^2 is



R^3 is



4,954,620

THERMOCONDENSED LIGNOCELLULOSE MATERIAL, AND A METHOD AND AN OVEN FOR OBTAINING IT

Jean-Paul Bourgeois, Creteil, France, assignor to Association Pour la Recherche et le Developpement des Methods et Processus Industriels, France

Division of Ser. No. 941,178, Dec. 12, 1986, Pat. No. 4,816,572. This application Sep. 27, 1988, Ser. No. 249,939
Claims priority, application France, Dec. 18, 1985, 85 18765
Int. Cl.[5] C08G *18/08*
U.S. Cl. 536—56 4 Claims

1. A thermocondensed lignocellulose material obtained by heat treatment of lignocellulose material characterized by:

(1) the material being highly hydrophobic and having a residual hemi-cellulose content, wherein the said residual hemi-cellulose content is less than 2% by mass;

(2) a substantially total absence of internal tar and having a benzopyrene content, wherein the said benzopyrene content is less than 2 μg/kg and having a fixed carbon content, wherein the said fixed carbon content is between about 27 and 35% by weight; and

(3) a net calorific value (PCi) which is at least 20% greater than that of the material prior to treatment.

4,954,621

PROCESS FOR PRODUCING SUCROSE FATTY ACID POLYESTER

Kazuhiko Masaoka, Suzuka, and Yukio Kasori, Yokkaichi, both of Japan, assignors to Mitsubushi Kasei Corporation, Japan

Filed Jun. 6, 1989, Ser. No. 362,275
Claims priority, application Japan, Jun. 14, 1988, 63-144743; Jun. 14, 1988, 63-144744; Jun. 14, 1988, 63-144745
Int. Cl.[5] C07H *13/00, 1/00;* B01J *20/00*
U.S. Cl. 536—119 10 Claims

1. A process for producing a sucrose fatty acid polyester comprising reacting sucrose with fatty acid lower alcohol ester(s) in a solvent in the presence of an alkaline catalyst, wherein said fatty acid lower alcohol ester(s) are employed in an amount at least 5 times by mol as much as said sucrose; the alkaline catalyst component is removed from the reaction product thus obtained; and the obtained sucrose fatty acid polyester-containing solution is catalytically treated with activated clay.

4,954,622

PHARMACEUTICAL COMPOSITION AND METHOD CONTAINING GAMMA INULIN OR DERIVATIVE THEREOF

Peter D. Cooper, Monash, Australia, assignor to The Australian National University, Acton, Australia

PCT No. PCT/AU86/00311, § 371 Date Aug. 3, 1987, § 102(e) Date Aug. 3, 1987, PCT Pub. No. WO87/02679, PCT Pub. Date May 7, 1987
PCT Filed Oct. 17, 1986, Ser. No. 86,634
Claims priority, application Australia, Oct. 31, 1985, PH3187/85
Int. Cl.[5] C08B *37/18;* A61K *31/715*
U.S. Cl. 536—127 1 Claim

1. A process for the preparation of gamma inulin from crude inulin, which comprises the steps of:

(a) recrystallizing said crude inulin from water at a temperature substantially below 37° C. to obtain a finely divided particulate in suspension;

(b) heating said suspension at a temperature in the range of from about 25° to 45° C. for approximately 1 to 3 days;

(c) further heating said suspension at a temperature in the range of from about 40° to 55° C. for approximately 0.5 to 1.5 hours; and

(d) isolating the thus-formed insoluble gamma inulin from the suspension.

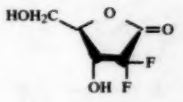
4,954,623

RECOVERY OF DIFLUORO SUGAR

Ramakrishnan Nagarajan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

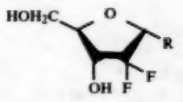
Continuation-in-part of Ser. No. 325,726, Mar. 20, 1989. This application Nov. 13, 1989, Ser. No. 434,219
Int. Cl.[5] C07H *1/00, 5/00;* C07D *307/00*
U.S. Cl. 536—127 30 Claims

15. A process for preparing 2-deoxy-2,2-di-fluororibofurano-1,4-lactone of the formula



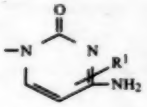
III

comprising reacting an α-difluoronucleoside of the formula

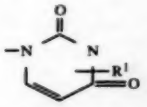


II

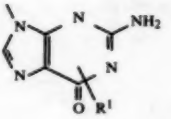
wherein R is



(a)

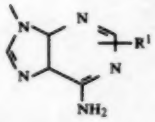


(b)



(c)

or



(d)

R^1 is hydrogen, C_1–C_3 alkyl or halo;

with a reducing agent capable of reducing the double bond β to the point of attachment of the R moiety;

hydrolyzing the reduced intermediate in an aqueous acid medium;

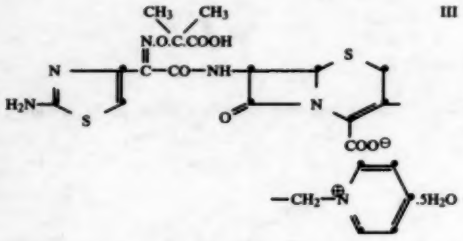
and oxidizing the pyranose.

4,954,624
PROCESS FOR THE PRODUCTION OF CEPHALOSPORIN DERIVATIVES

Bernhard C. Prager, Wörgl, Austria, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 213,570, Jun. 7, 1988, abandoned. This application Jun. 29, 1989, Ser. No. 385,591
Int. Cl.[5] C07D *501/38*; A61K *31/545*
U.S. Cl. 540—225 15 Claims

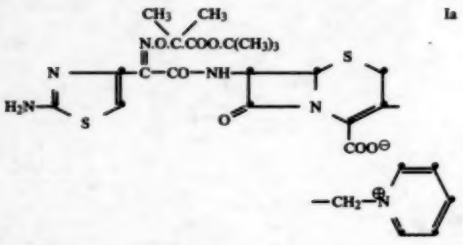
1. A process for the preparation of the pentahydrate of ceftazidime of formula III



III

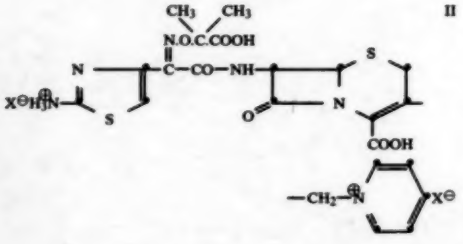
which consist essentially of the steps:

(a) hydrolyzing the ester of formula Ia



Ia

in concentrated hydrochloric acid to form an aqueous solution of the dihydrochloride salt of formula II



II

where X is a chloride anion, and

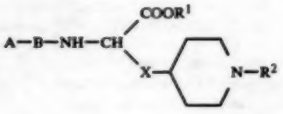
(b) adjusting the pH of the aqueous solution of the dihydrochloride salt of formula II from step a to 3.6 to 4.1 with a base to obtain the pentahydrate of formula (III).

4,954,625
PIPERIDINE DERIVATIVES, THEIR PRODUCTION AND USE

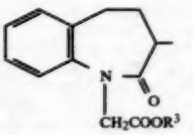
Hirosada Sugihara, Osaka; Kohei Nishikawa, Kyoto, and Katsumi Ito, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

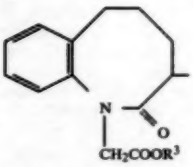
Division of Ser. No. 218,951, Jul. 14, 1988, Pat. No. 4,871,842, which is a continuation of Ser. No. 806,810, Dec. 10, 1985, abandoned. This application Aug. 30, 1989, Ser. No. 400,680
Claims priority, application PCT Int'l Appl., Dec. 21, 1984, PCT/JP84/00608; Feb. 8, 1985, PCT/JP85/00052; May 22, 1985, PCT/JP85/00280; Japan, Sep. 20, 1985, 60-209319 Int. Cl.
Int. Cl.[5] C07C *103/52*, *417/12*; A61K *37/02*, *31/55*
U.S. Cl. 540—500 9 Claims

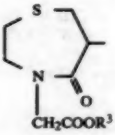
1. A compound of the formula:

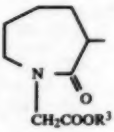


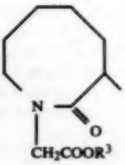
wherein A—B is a group represented by the formula:











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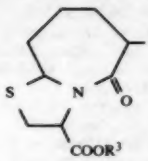
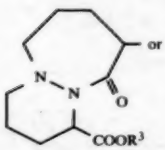
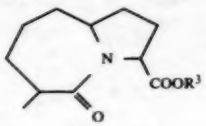






wherein R^3 is hydrogen, lower alkyl or aralkyl; R^1 is hydrogen, lower alkyl or aralyl; R^2 is hydrogen, lower alkyl, aralkyl, or acyl; and X is alkylene;
or a pharmaceutically acceptable salt thereof.

4,954,626

TETRAHYDROINDAZOLYL-BENZOXAZINES, THEIR PRODUCTION AND USE

Masayuki Enomoto, Takarazuka; Eiki Nagano, Tokyo; Toru Haga, Toyonaka; Kouichi Morita, Kasai, and Ryo Sato, Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

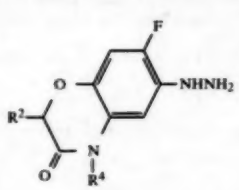
Division of Ser. No. 234,619, Aug. 22, 1988, Pat. No. 4,877,444. This application Mar. 20, 1989, Ser. No. 326,214

Claims priority, application Japan, Aug. 27, 1987, 62-213946; Feb. 24, 1988, 63-42922

Int. Cl.[5] **C07D** *265/36*

U.S. Cl. 544—105 **11 Claims**

1. A compound of the formula:



wherein R^2 is a hydrogen atom or a methyl group and R^4 is a hydrogen atom, a C_1–C_6 alkyl group, a C_3–C_7 alkenyl group, a C_3–C_7 alkynyl group, a halo(C_1–C_5)alkyl group, a halo(C_3–C_4)alkenyl group, a halo (C_3–C_4)alkynyl group, a C_1–C_4 alkoxy(C_1–C_2)alkyl group or a C_1–C_2 alkylthio(C_1–C_2)alkyl group.

4,954,627

PROCESS FOR DESULFURIZATION OF ISOTHIOUREAS AND ISOTHIOAMIDES

Dennis E. Jackman, Prairie Village, and John G. Morgan, Stilwell, both of Kans., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,739

Int. Cl.[5] **C07D** *253/00*

U.S. Cl. 544—182 **6 Claims**

1. A process for the desulfurization of a compound selected from isothioureas and isothioamides comprising heating the compound to be desulfurized in the presence of a mercaptanol to produce the corresponding desulfurized keto compound.

4,954,628

PROCESS FOR PREPARING N-SULPHONYL-UREAS

Gábor Besenyei; Sándor Németh; László Simándi; Mária Belák; Mária Szabó, all of Budapest; József Dukai, Veszprém; Lajos Nagy, Füzfógyártelep; Elemér Tömördi, Veszprém; Csaba Söptei, Veszprém, and Erzsébet E. Diószeginé, Veszprém, all of Hungary, assignors to Nitrokáelepek, Füfögyártelep and Magyar Tudományos Akadémia Kozponti Kémiai Kutató Intézete, Budapest, both of, Hungary

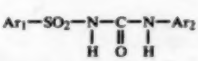
Filed Mar. 2, 1989, Ser. No. 317,769

Claims priority, application Hungary, Mar. 4, 1988, 2251-1062/88

Int. Cl.[5] **C07D** *251/42, 239/69, 239/42, 213/75*

U.S. Cl. 544—211 **16 Claims**

15. A process for preparing a sulfonylurea of the formula



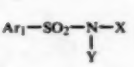
(I)

wherein

Ar_1 is phenyl, naphthyl- or thienyl moiety or the derivatives thereof substituted by C_{1-4} alkyl, C_{1-4} haloalkyl, (halo)alkoxycarbonyl, (halo)alkyloxy, nitro, cyano moiety, or by halogen atoms,

Ar_2 is a phenyl-, pyridyl-, pyrimidinyl or triazinyl moiety or the derivatives thereof substituted by C_{1-4} (halo)alkyl, C_{1-4} (halo)alkyloxy, amino, O-aryl-sulphonyl, O-(substituted carbamoyl)-moiety, or by halogen atoms,

which comprises reacting a N-halogen-aryl-sulfonamidate of the formula



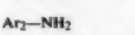
(II)

wherein

Ar_1 has the above meaning,

X is chlorine or bromine,

Y is a sodium, potassium, quaternary ammonium or quaternary phosphonium moiety, with an aromatic amine of the formula



(II)

wherein Ar_2 has the above meaning, in the presence of a carbonylation catalyst and carbon monoxide.

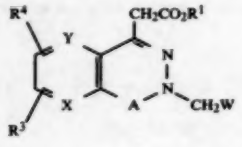
4,954,629

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF OXOPHTHALAZINYL ACETIC ACIDS AND ANALOGS THEREOF

Banavara L. Mylari, Waterford, and William J. Zembrowski, Oakdale, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 11, 1989, Ser. No. 350,997
Int. Cl.[5] C07D *519/00, 417/06, 471/04, 487/04*
U.S. Cl. 544—237 2 Claims

1. A compound of the formula



IV

wherein W is

R^1 is C_1–C_6 alkyl; R^3 and R^4 are the same or different, and are hydrogen, fluoro, chloro, bromo, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, or nitro, or R^3 and R^4 taken together are C_1–C_4 alkylenedioxy; X and Y are CH, and A is C=O.

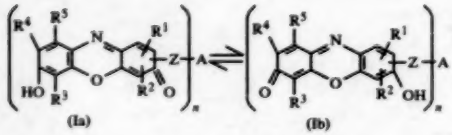
4,954,630

RESORUFIN DERIVATIVES

Christian Klein, Weilheim; Hans-Georg Batz, Tutzing, and Rupert Herrmann, Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 889,676
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526565
Int. Cl.[5] C07D *265/38*
U.S. Cl. 544—102 9 Claims

1. A resorufin derivative of the formula:



(Ia) (Ib)

wherein R^1, R^2, R^3, R^4 and R^5, which can be the same or different, are hydrogen, halogen, carboxyl, carboxamido, C_1–C_5 alkoxy-carbonyl, cyano, nitro, C_1–C_5 alkyl, C_1–C_5 alkoxy; or C_1–C_5 alkyl or C_1–C_5 alkoxy substituted by carboxyl, carboxamido, C_1–C_5 alkoxy-carbonyl, cyano or nitro; or R_1, R_2 and R_3 are as defined above and R^4 and R^5 together represent an anellated aromatic residue, Z is bridge member, A is the residue of a ligand and n is a whole number of from 1 to 200.

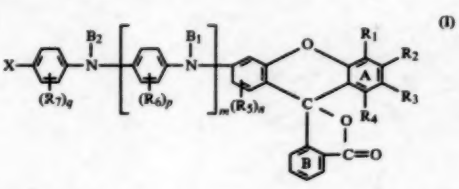
4,954,631

FLUORAN COMPOUNDS AND COLOR FORMING RECORDING MATERIALS USING SAME

Takeo Obitsu, Omiya; Yutaka Ohnishi, Urawa; Shinji Yoshinaka, Iwatsuki; Minoru Koguchi, Ageo; Mitsuhiro Yanagita, and Nobuyuki Hirai, both of Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Japan

Division of Ser. No. 79,456, Jul. 29, 1987, Pat. No. 4,826,806.
This application Feb. 2, 1989, Ser. No. 305,554
Claims priority, application Japan, Jul. 31, 1986, 61-181224; Oct. 27, 1986, 61-253650; Nov. 7, 1986, 61-263889; Dec. 8, 1986, 61-290379; Dec. 19, 1986, 61-301421
Int. Cl.[5] C07D *211/14, 207/08*
U.S. Cl. 546—15 13 Claims

1. A fluoran compound of formula (I)



(I)

wherein R_1, R_2, R_3 and R_4 are the same or different and each is selected from the group consisting of hydrogen, halogen, lower alkoxy, alkyl of 1 to 9 carbons, cycloalkyl of 5 or 6 carbons, substituted and unsubstituted benzyl or phenyl, said substituted benzyl or phenyl having substituents selected from the group consisting of halogen, lower alkyl and lower alkoxy, and further, R_1 and R_2, as well as R_3 and R_4, when taken together with ring A, form a naphthalene ring, said naphthalene ring being unsubstituted or substituted by a halogen, lower alkyl or lower alkoxy group; R_5, R_6 and R_7 are the same or different and each represents a halogen, lower alkyl or lower alkoxy group; B_1 and B_2 are the same or different and each represents hydrogen, alkyl or 1 to 8 carbons, benzyl or phenyl, said benzyl or phenyl being unsubstituted or substituted by a halogen, lower alkyl, lower alkoxy, or alkyl-substituted amino group; X represents hydrogen or $—NR_8R_9$ wherein R_8 and R_9 are the same or different and each represents hydrogen, alkyl of 1 to 8 carbons, cycloalkyl of 5 or 6 carbons, or benzyl, said benzyl being unsubstituted or substituted by a halogen, lower alkyl, lower alkoxy, or alkyl-substituted amino group; and further, R_8 and R_9, when taken together with the adjacent nitrogen atom to which they are attached form a pyrrolidino, piperidino or morpholino ring; ring B being unsubstituted or substituted by a halogen; n, p and q independently represent 0, 1 or 2; and m represents 0, 1, 2 or 3, provided that when m is 0 or 1, x is not a hydrogen atom.

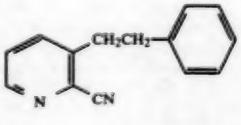
4,954,632

PROCESS FOR PREPARING INTERMEDIATES FOR AZATIDINE

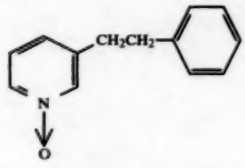
Raymond E. Dagger, Warminster, and Linda A. Motyka, Exton, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Division of Ser. No. 127,840, Dec. 2, 1987, Pat. No. 4,843,163.
This application Feb. 10, 1989, Ser. No. 308,571
Int. Cl.[5] C07D *211/68, 211/78, 401/00*
U.S. Cl. 546—194 4 Claims

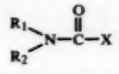
1. A process for preparing 3-phenethyl-2-cyanopyridine of the formula:



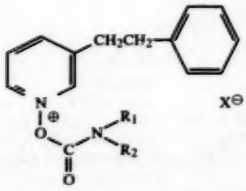
which comprises reacting 3-phenethylpyridine-N-oxide of the formula:



with a carbamoyl halide of the formula:



in which R_1 and R_2 are C_{1-4} alkyl or, taken together with nitrogen atom to which they are attached, pyrolidinyl or piperidinyl and X is chloro, bromo or iodo, to obtain a 3-phenethyl-1-carbamoyloxypyridinium halide of the formula:



in which R_1, R_2 and X are as defined above; and reacting the pyridinium halide with an alkali metal cyanide in aqueous solution.

4,954,633

ISOXAZOLINES AS INTERMEDIATES TO FURANS

Hans Theobald, Limburgerhof; Rainer Becker, Bad Durkheim, and Walter Himmele, Walldorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

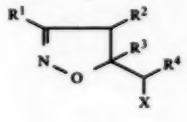
Continuation of Ser. No. 270,475, Nov. 4, 1988, abandoned, which is a continuation of Ser. No. 154,431, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 813,981, Dec. 27, 1985, abandoned. This application Jul. 25, 1989, Ser. No. 384,910

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1984, 3447793; Apr. 20, 1985, 3514384

Int. Cl.[5] C07D *261/04*

U.S. Cl. 548—240 **3 Claims**

1. An isoxazoline of the formula II



(II)

in which

R^1 is benzyl or benzyl substituted by halogen,

R^2 is hydrogen,

R^3 is hydroxymethyl or hydroxymethyl which is blocked by a protective group selected from the group consisting of t-butyl, trimethylsilyl, acetyl or benzyl,

R^4 is hydrogen or methyl,

X is hydroxy, halogen or hydroxy blocked by a protective group selected from the group consisting of t-butyl, trimethylsilyl, acetyl or benzyl.

4,954,634

PROCESS FOR THE SELECTIVE N-ACYLATION OF AMINOHYDROXAMIC ACID DERIVATIVES AND STARTING MATERIALS USED THEREIN

Peter Heinrich, Binningen, and Theophile Moerker, Füllinsdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

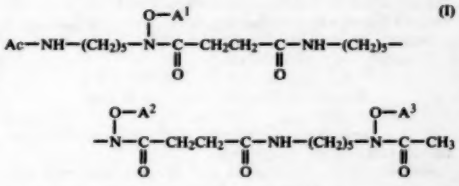
Filed Jul. 20, 1988, Ser. No. 221,953

Claims priority, application Switzerland, Jul. 23, 1987, 2792/87

Int. Cl.[5] C07D *233/54*

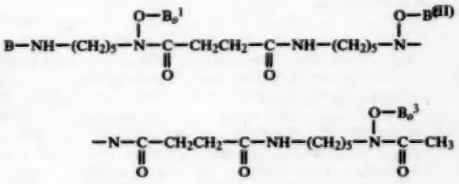
U.S. Cl. 548—341 **10 Claims**

1. A process for the manufacture of a compound of formula I

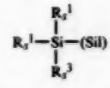


(I)

in which Ac is C_2–C_{20}-alkanoyl, benzoyl, C_{18}-alkenoyl, (C_1–C_{12}-alkoxy)carbonyl, a radical of the formula —CO—O—(CH_2—CH_2—O—)$_n$-lower alkyl in which n is from 1 to 19, chlorocarbonyl, (1-imidazolyl)-carbonyl, N-di-lower alkylcarbamoyl, N-(C_1–C_5-alkyl)-carbamoyl substituted in the 1- or 2-position of the alkyl moiety by (C_1–C_4-alkoxy)-carbonyl, N-(chlorosulfonyl)-carbamoyl, N-(lower alkoxysulfonyl)-carbamoyl or a radical of the formula —SO_2—N-H—CO(—O—CH_2—CH_2)$_n$-lower alkoxy in which n is from 0 to 19, and A^1, A^2 and A^3 are each hydrogen, characterized in that a compound of formula II



in which each of B, B_o^1, B_o^2 and B_o^3 is an organic silyl group (sil) of formula



wherein R_s^1 and R_s^2, independently of one another, are each C_1–C_8-alkyl, phenyl, p-tolyl, benzyl or phenethyl and R_s^3 is C_1–C_8-alkyl, phenyl, p-tolyl, benzyl, phenethyl or chlorine, is reacted with an acylating agent selected from the group consisting of

(1) Ac^4Y, wherein Ac^4 is C_2–C_{20}-alkanoyl, benzoyl, C_{18}-alkenoyl, (C_1–C_{20}-alkoxy)-carbonyl, a radical of the formula —CO—O—(CH_2—CH_2—O—)$_n$-lower alkyl in which n is from 1 to 19, chlorocarbonyl, (1-imidazolyl)-carbonyl, N-di-lower alkylcarbamoyl, N-(C_1–C_5-alkyl)-carbamoyl substituted in the 1- or 2-position of the alkyl moiety by (C_1–C_4-alkoxy)carbonyl, or a radical of the

formula $-SO_2-NH-CO(-O-CH_2-CH_2)_n$-lower alkoxy in which n is from 0 to 19, and Y is chlorine, 1-imidazolyl, bromine or azido,

(2) chlorosulfonylisocyanate,

(3) $R^4-N=C=O$ wherein R^4 is C_1–C_5-alkyl substituted in the 1- or 2-position of the alkyl moiety by (C_1–C_4-alkoxy)-carbonyl,

(4) Ac^5-O-Ac^5, wherein Ac^5 is C_2–C_{20}-alkanoyl, benzoyl, C_{18}-alkenoyl, (C_1–C_{12}-alkoxy)-carbonyl, a radical of the formula $-CO-O-(CH_2-CH_2-O-)_n$-lower alkyl in which n is from 1 to 19, chlorocarbonyl, and

(5) $R^3=C=O$ wherein R^3 is C_2–C_{20}-alkylidene or C_{18}-alkenylidene,

and solvolytically splitting off the O-bonded organic silyl groups Sil present by treatment with a lower alkanol.

4,954,635

PROCESS FOR PREPARING QUATERNIZED IMIDAZOLINE FABRIC CONDITIONING COMPOUNDS

Theresa Rosario-Jansen, Fairfield, Ohio, and Glen D. Lichtenwalter, Corsicana, Tex., assignors to The Procter & Gamble Company, Cincinnati, Ohio

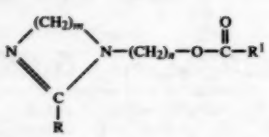
Filed Sep. 6, 1989, Ser. No. 403,541

Int. Cl.[5] C07D *239/06, 233/14, 243/04*

U.S. Cl. 548—354 **17 Claims**

1. A process for quaternizing an imidazoline ester compound, said process comprising:

(a) forming an anhydrous melt of an imidazoline ester compound of the formula

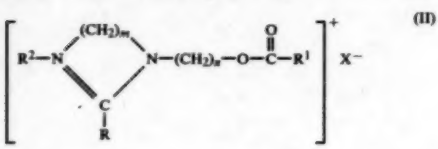


(I)

wherein R and R^1 are, independently, a C_{11}–C_{21} hydrocarbyl group, and m and n are, independently, from 2 to 4 inclusive;

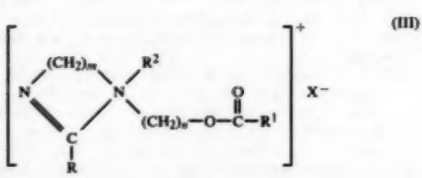
(b) contacting said anhydrous melt with a quaternizing agent of the formula R^2X or $R^2{}_2X$, wherein R^2 is a C_1–C_3 alkyl or benzyl group and X is a halide or sulfate, to form a liquid reaction mixture, said liquid reaction mixture being maintained free of lower alcohol solvents; and

(c) maintaining said liquid reaction mixture under anhydrous conditions at a temperature ranging from about 50° C. to about 100° C. for a period of time sufficient for substantially all of said quaternizing agent to react with said imidazoline ester compound to form a quaternized imidazoline ester compound of the formula



(II)

or



(III)

or mixtures thereof, wherein R, R^1, R^2, X, m and n are as defined in subparagraphs (a) and (b).

4,954,636

ANTIMICROBIAL POLYMERIC BISBIGUANIDES

John J. Merianos, Middletown, and Paul Garelick, South Plainfield, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Jul. 3, 1989, Ser. No. 374,891

Int. Cl.[5] C07D *207/12;* **C07C** *279/12, 277/08*

U.S. Cl. 548—519 **24 Claims**

1. Antimicrobial polymeric bisbiguanides capped with alkylene pyrrolidonyl groups.

4,954,637

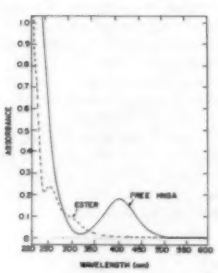
CERTAIN MALEIMIDE-N-ALKYLENECARBOXYLATE-ORTHO-NITROBENZENESULFONIC ACID ESTERS AND DERIVARIVES USEFUL FOR COUPLING BIOLOGICAL MATERIALS

Danute E. Nitecki, Berkeley, and Lois Aldwin, San Mateo, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

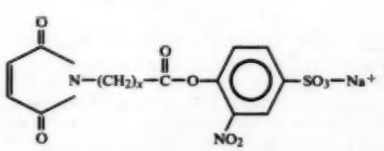
Continuation-in-part of Ser. No. 839,447, Mar. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 637,905, Aug. 9, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 95,325

Int. Cl.[5] C07D *207/452*

U.S. Cl. 548—546 **2 Claims**



1. The compound having the formula



wherein x is an integer of from 1 to 10.

4,954,638

LEUKOTRIENE BY AMIDES AND HYDRAZIDES

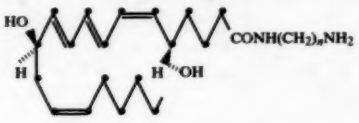
Robert N. Young, Senneville; Joshua Rokach, Chemedey, Laval, both of Canada, and Edward C. Hayes, Lincroft, N.J., assignors to Merck Frosst Canada, Inc., Kirkland, Canada and Merck & Co., Inc., Rahway, N.J.

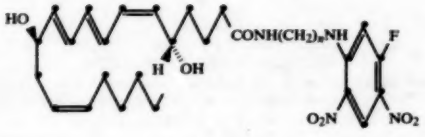
Division of Ser. No. 859,971, May 5, 1986, Pat. No. 4,767,745, which is a continuation of Ser. No. 665,596, Oct. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 565,263, Dec. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 370,229, Apr. 20, 1982, abandoned, and a continuation-in-part of Ser. No. 560,663, Dec. 12, 1983, abandoned. This application Aug. 1, 1988, Ser. No. 227,038

Int. Cl.[5] C07D *207/404*; C11C *3/00*

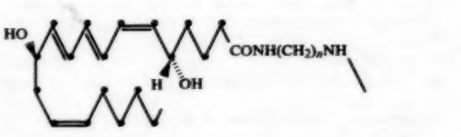
U.S. Cl. 548—546 **4 Claims**

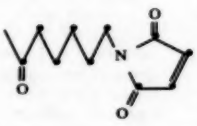
1. A compound of the formula:





or





wherein n is 0 to 10.

4,954,639

SINGLE POT PROCESS FOR MAKING A FLUOROANTHRANILIC ACID

Lawrence B. Fertel, Kenmore, and Neil J. O'Reilly, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 28, 1989, Ser. No. 399,131

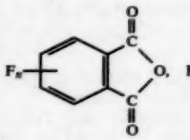
Int. Cl.[5] C07D *209/48*

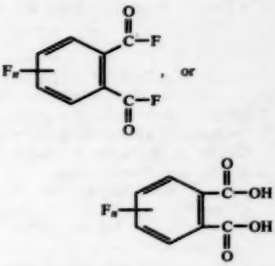
U.S. Cl. 548—475 **20 Claims**

1. A method of making an ionized fluoroanthranilic acid comprising

(A) preparing an aqueous solution of

(1) a fluorophthalic compound selected from the group consisting of





and mixtures thereof, where "n" is 1 to 4, at a concentration of about 5 to about 30% by weight, based on the weight of water in said solution; and

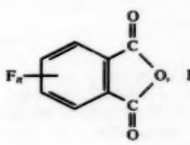
(2) about 1 to about 1.5 equivalents of a hydroxylamine compound selected from the group consisting of hydroxylamine and mineral acid salts thereof; and

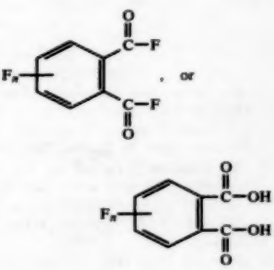
(B) maintaining the pH of said solution at at least about 11 and the temperature of said solution at at least 90° C. where said method is performed in a single pot without isolating any intermediate product.

15. A method of making a fluoro-N-hydroxyphthalimide comprising

(A) preparing an aqueous solution of

(1) a fluorophthalic compound selected from the group consisting of





and mixtures thereof, wherein "n" is 1 to 4, at a concentration of about 5 to about 30% by weight, based on the weight of water in said solution;

(2) about 1 to about 1.5 equivalents of a hydroxylamine compound selected from the group consisting of hydroxylamine and mineral acid salts thereof; and

(3) about 1 equivalent of a water soluble base, based on said hydroxylamine compound; and

(B) maintaining the pH of said solution at less than about 11 and the temperature of said solution at at least 90° C.

4,954,640

ALPHA-METHYL BENZYL AMINE SALT OF INDOLINE -2-CARBOXYLIC ACID

Michel Vincent, Bagneux; Jean Baliarda, Anthony; Bernard Marchand, Checy, and Georges Remond, Versailles all of France, assignors to ADIR et Cie, Courbevoie, France

Division of Ser. No. 245,352, Sep. 16, 1988, Pat. No. 4,902,817. This application Jan. 10, 1990, Ser. No. 462,797

Claims priority, application France, Sep. 17, 1987, 87.12900

Int. Cl.[5] C07D *209/18*

U.S. Cl. 548—490 **1 Claim**

1. The sale of (+)-α-methylbenzyamine with (S) -2-carboxyindoline having a rotatory power determined using the D line

of sodium at 21 degrees Centigrade which is not greater than −5.3 when measured in ethanol at a concentration of 1%.

4,954,641

NOVEL ANTITUMOR ANTIBIOTIC SUBSTANCE AND A METHOD FOR PRODUCTION THEREOF

Yoshikazu Sato; Hiroomi Watabe; Shigetaka Ishii; Tadashi Nakazawa; Takashi Shomura; Masaji Sezaki, and Shinichi Kondo, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jan. 30, 1989, Ser. No. 303,230

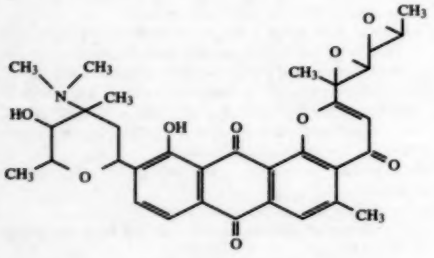
Claims priority, application Japan, Jan. 28, 1988, 63-15983

Int. Cl.[5] C07D *311/78*

U.S. Cl. 549—384 **1 Claim**

1. An antibiotic substance represented by formula (I)

(I)



or a pharmaceutically acceptable salt thereof.

4,954,642

FORSKOLIN COMPOUNDS

Tochiro Tatee, Tokyo; Takashi Takahira, Yono; Kouwa Yamashita, Urawa; Masao Sakurai, Ageo; Akira Shiozawa, Omiya, and Kazuhisa Narita, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

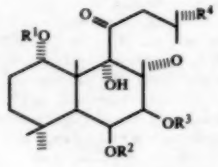
Continuation-in-part of Ser. No. 926,102, Nov. 3, 1986, abandoned. This application May 30, 1989, Ser. No. 361,763

Claims priority, application Japan, Nov. 15, 1985, 60-254693; Jan. 27, 1986, 61-13771; Mar. 13, 1986, 61-53709; Mar. 26, 1986, 61-65947

Int. Cl.[5] C07D *311/92*

U.S. Cl. 549—389 **8 Claims**

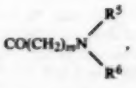
1. A forskolin derivative represented by the formula



wherein;

R^1 is hydrogen and R^4 is vinyl, ethyl, or cyclopropyl, and

(1) either of R^2 and R^3 denotes a residue represented by the formula



wherein each of R^5 and R^6 denotes hydrogen or lower alkyl and m is an integer of 1 to 5, and the other one of R^2 and R^3 denotes hydrogen or a residue represented by the formula $CO(CH_2)_nX$, X being hydrogen or

wherein, each of R^7 and R^8 denotes hydrogen or lower alkyl and n being an integer of 1 to 5, or

(2) R^2 de notes hydrogen or $—COCH_2CH_2CO_2H$ and R^3 denotes hydrogen, $—COCH_3$, $—COCH_2CH_2CH_2CO_2H$, or $—COCH(OH)CH_2OH$ with the proviso that R^3 is one of the last two residues when R^2 is hydrogen, and

physiologically acceptable salts of said forskolin derivative.

4,954,643

PROCESS FOR PREPARATION OF PERFLUOROPROPANE OXIDE

Giorgio Bornengo, 8, via Paletta; Filippo M. Carlini, 7, C.so Torino; Michele Pontevivo, 4, via Monte Nero, and Giorgio Bottaccio, 16, via Manin, all of Novara, Italy

Continuation of Ser. No. 902,078, Aug. 28, 1986, abandoned, which is a continuation of Ser. No. 674,920, Nov. 26, 1984, abandoned. This application Jan. 31, 1989, Ser. No. 306,262

Claims priority, application Italy, Nov. 28, 1983, 23908 A/83

Int. Cl.[5] C07D *303/00*

U.S. Cl. 549—531 **12 Claims**

1. A process for the preparation of perfluoropropene oxide by:

(A) mixing perfluoropropene with an inert organic solvent substantially immiscible with water, an aqueous solution of hydrogen peroxide, an organic water miscible solvent, and a phase transfer catalyst selected from the group consisting of quaternary ammonium salts, quaternary phosphonium salts, and lipophilic complexing agents for cations at a temperature between −10° C. to −60° C.; and

(B) gradually adding to the mixture with stirring an aqueous solution of an inorganic base over a period of time from between 15 minutes to 6 hours, the rate of addition being chosen so as to maintain the temperature of the reaction mixture constant.

4,954,644

RUTHENIUM-PHOSPHINE COMPLEX

Noboru Sayo; Toshiro Takemasa, and Hidenori Kumobayashi, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Filed Sep. 7, 1988, Ser. No. 241,434

Claims priority, application Japan, Sep. 8, 1987, 62-224288

Int. Cl.[5] C07F *15/00, 3/06, 7/22, 7/28*

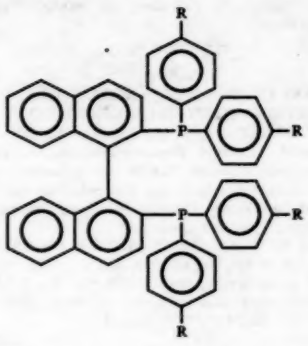
U.S. Cl. 556—14 **5 Claims**

1. A ruthenium-phosphine complex of formula (I):

$$[Ru(R\text{-}BINAP)Cl_4M]_mX_n \quad (I)$$

wherein R-BINAP is a tertiary phosphate of formula (II):

(II)



wherein R is the same and is hydrogen atom or methyl group; M is a Lewis acid selected from $ZnCl_2$, $AlCl_3$, $TiCl_4$, and $SnCl_4$; X is $N(C_2H_5)_3$ or CH_3CO_2; in the same case that X is $N(C_2H_5)_3$, then k is 2, m is 2, and n is 1; and in the case that X CH_3CO_2, then k is 0, m is 1, and n is 2.

4,954,645

DITHIOACID RHENIUM SULFIDE DIMER COMPOSITIONS

Thomas R. Halbert, Annandale; Liwen Wei, Somerville, and Edward I. Stiefel, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 202,341, Jun. 6, 1988, abandoned. This application Jul. 26, 1989, Ser. No. 385,049

Int. Cl.[5] C07F *13/00*

U.S. Cl. 556—45 **8 Claims**

1. A compound having the formula $[L_2Re(\mu\text{-}S)]_2$ wherein L is a 1,1-dithioacid and μ denotes that the sulphur atoms in the core of the compound bridge the rhenium atoms in the compound.

4,954,646

PROCESS FOR THE PREPARATION OF SULFATED ALKANOL OXETHYLATES OR ALKYLPHENOL OXETHYLATES HAVING A LOWERED CONTENT OF 1,4-DIOXANE

Rudolf Aigner; Günther Müller, both of Burgkirchen; Rainer Müller, and Horst Reuner, both of Burghausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 1, 1989, Ser. No. 305,298

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1988, 3803110

Int. Cl.[5] C07C *141/02, 141/16*

U.S. Cl. 558—31 **10 Claims**

1. A process for the preparation of sulfated alkanol oxethylates or alkylphenol oxethylates, in which at least one liquid alkanol oxethylate or alkylphenol oxethylate is brought into contact, with cooling, with a gas mixture which contains in addition to at least one inert gas, 1 to 8% by volume, relative to the gas mixture, of gaseous SO_3 in the ratio of 0.9 to 1 mol of SO_3 per mol of OH groups in the alkanol oxethylate or alkylphenol oxethylate, after completion of the reaction the liquid reaction mixture and the gas are separated from one another and the liquid reaction mixture is neutralized using aqueous alkali metal hydroxide, magnesium hydroxide, ammonium hydroxide or substituted ammonium hydroxide, which comprises admixing 0.1 to 5% by weight, relative to the alkanol oxethylate or alkylphenol oxethylate employed, of at least one of the following compounds: water, ethanol, 1-propanol, 2-propanol or nheptane to the reaction mixture after completion of the reaction with SO_3, but before the separation of liquid reaction mixture and gas, and the temperature during the separation of liquid and gas being 20 to 60° C.

4,954,647

PROCESS FOR OPTICALLY ACTIVE 3-(METHANE-SULFONYLOXY) THIOLANE AND ANALOGS

Frank J. Urban, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

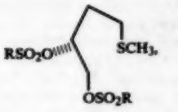
Division of Ser. No. 183,102, Apr. 19, 1988, Pat. No. 4,874,877. This application Jul. 19, 1989, Ser. No. 382,602

Int. Cl.[5] C07C *141/02*

U.S. Cl. 558—46 **3 Claims**

1. A compound having the formula

(III)



wherein R is $(C_1\text{-}C_3)$alkyl, phenyl or tolyl.

4,954,648

METHOD FOR THE BROMINATION OF AROMATIC COMPOUND

Ori Lerman, Ramat-Gan, and Shlomo Rozen, Tel-Aviv, both of Israel, assignors to Ramot University Authority of Applied Research and Industrial Development Ltd. and ICL Industries Ltd., both of, Israel

Filed May 11, 1989, Ser. No. 350,394

Claims priority, application Israel, May 12, 1988, 86353

Int. Cl.[5] C07C *121/52, 69/72*

U.S. Cl. 558—425 **10 Claims**

1. A method for the bromination of an aromatic compound comprising reacting said aromatic compound with a bromination agent comprising bromine-trifluoride and bromine at a temperature of above about minus ten degrees centigrade, and separating the obtained brominated aromatic compound from the original reactants by known organic chemistry techniques.

4,954,649

METHOD FOR PRODUCING CITRATES

Ezekiel H. Hull, Greensboro, and Edward P. Frappier, Kernersville, both of N.C., assignors to Morflex Chemical Company, Inc., Greensboro, N.C.

Continuation of Ser. No. 97,801, Sep. 17, 1987, Pat. No. 4,883,905, which is a continuation of Ser. No. 886,463, May 22, 1986, Pat. No. 4,710,532, which is a continuation of Ser. No. 711,284, Mar. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,583, Jun. 11, 1984, abandoned. This application Jun. 21, 1989, Ser. No. 369,127

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[5] C07C *67/08*

U.S. Cl. 560—180 **12 Claims**

1. A method of producing a 99% pure citrate ester selected from the group consisting of acetyltri-n-butyl citrate, acetyltri-n-hexyl citrate, n-butyryltri-n-hexyl citrate, acetyltri-n-(hexyl-/octyl/decyl) citrate and acetyltri-n-(octyl/decyl) citrate, comprising the steps of: heating an alcohol and citric acid in the presence of an organic titanate at a temperature to effect esterification, removing the excess alcohol, alkoxylating the ester while maintaining the temperature below approximately 110° C. until the alkoxylation reaction is complete, cooling and thereafter neutralizing the ester, said ester being 99% pure.

4,954,650

METHOD FOR PRODUCTION OF METHACRYLIC ACID

Tadashi Abe; Mitsuyoshi Manabe, both of Niihama; Koji Deguchi, Ibo; Hiroyuki Uhara, Tatsuno, and Yukio Aoki, Ibo, all of Japan, assignors to Sumitomo Chemical Company, Ltd. and Nippon Shokubai Kagaku Kogyo Co., Ltd., both of Osaka, Japan

Filed Jul. 10, 1989, Ser. No. 377,119

Claims priority, application Japan, Jul. 11, 1988, 63-172261

Int. Cl.[5] C07C *51/16, 51/235;* B01J *33/00, 1/00, 8/04, 10/00;* C10G *34/00*

U.S. Cl. 562—534 9 Claims

1. In a method for the production of methacrylic acid, in which methacrylic acid is produced by subjecting at least one member selected from the group consisting of isobutylene and tertiary butanol to catalytic vapor-phase oxidation with molecular oxygen in a first heat-exchanger type multitube reactor packed with an oxide catalyst containing bismuth, molybdenum, and iron thereby mainly forming methacrolein, then supplying the gas consequently formed by said reaction to a second heat-exchanger type multitube reactor connected directly to said first reactor and packed with an oxide catalyst containing molybdenum and phosphorus thereby subjecting said methacrolein to catalytic vapor-phase oxidation with molecular oxygen and consequently forming methacrylic acid the improvement comprising keeping a rodlike or platelike insert made of metallic material or ceramic material set in the empty space of the gas inlet part of the tube of said second reactor packed with said catalyst.

4,954,651

PROCESS FOR PREPARING TRANS-2,2-DIMETHYL-3-(2,2-DIHALOVINYL)-CYCLOPROPANE CARBOXYLIC ACID HALIDE

Gohfu Suzukamo, Osaka, Japan; Yoji Sakito, Montreal, Canada; Masami Fukao, Shiga, and Koji Hagiya, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

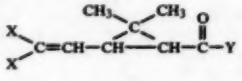
Filed May 1, 1989, Ser. No. 345,726

Claims priority, application Japan, May 2, 1988, 63-109456; May 26, 1988, 63-128625

Int. Cl.[5] C07C *5/00*

U.S. Cl. 562—856 29 Claims

1. A process for preparing trans-2,2-dimethyl-3(2,2-dihalovinyl)-cyclopropane carboxylic acid halides which comprises reacting arylphosphine with cis- or a cis/trans-mixture of 2,2dimethyl-3-(2,2-dihalovinyl)-cyclopropane carboxylic acid halide of the formula



wherein both X and Y are halogen atoms, respectively, in the presence or absence of an inert solvent and in the presence or absence of a halogen compound.

4,954,652

PRODUCTION OF ACETAMINOPHEN

John R. Fritch; Olan S Fruchey, and Theodore Horlenko, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 12, 1988, Ser. No. 217,652

Int. Cl.[5] C07C *231/05, 233/42, 235/12, 235/16*

U.S. Cl. 564—223 16 Claims

1. A process for the production of N-acetyl-para-aminophenol from 4-hydroxyacetophenone comprising reacting said 4-hydroxyacetophenone with hydroxylamine under conditions to form an aqueous solution of 4-hydroxyacetophenone oxime, extracting the oxime from said aqueous solution with an alkyl alkanoate ester to form a mixture of said oxime dissolved in said alkyl alkanoate ester, contacting said mixture with a Beckmann rearrangement catalyst to form said N-acetyl-para-aminophenol product and recovering said product from the alkyl alkanoate ester.

4,954,653

CATALYST ON THE BASIS OF SILICON AND TITANIUM HAVING HIGH MECHANICAL STRENGTH AND A PROCESS FOR ITS PREPARATION

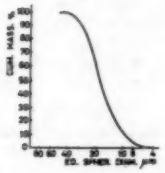
Giuseppe Bellussi, Piacenza; Franco Buonomo, San Donato Milanese; Antonio Esposito, San Donato Milanese; Mario Clerici, San Donato Milanese; Ugo Romano, Vimercate, and Bruno Notari, San Donato Milanese, all of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Division of Ser. No. 75,688, Jul. 20, 1987, Pat. No. 4,859,785, which is a division of Ser. No. 854,890, Apr. 23, 1986, Pat. No. 4,701,428. This application Jun. 7, 1989, Ser. No. 362,509

Claims priority, application Italy, Apr. 23, 1985, 20457 A/85

Int. Cl.[5] C07C *103/38*

U.S. Cl. 564—223 4 Claims



1. A method for the hydroxylation of aromatic hydrocarbons which comprises reacting a hydrocarbon with hydrogen peroxide in the presence of a catalyst said catalyst in the form of microspheres and comprising oligomeric silica and crystals of titanium-silicalite with an oligomeric silica/titanium-silicalite molar ratio in the rang of from 0.05 to 0.11, wherein said crystals of titanium silicalite are encaged with each other by means of Si-O-Si bridges.

4,954,654

PROCESS FOR THE PREPARATION OF SECONDARY AND TERTIARY AMINES

Howard F. Efner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1988, Ser. No. 237,380

Int. Cl.[5] C07C *209/26*

U.S. Cl. 564—446 12 Claims

1. A process for the preparation of dimethylcyclohexylamine, comprising reacting dimethylamine with cyclohexanone in the liquid phase in the presence of an unsupported Raney copper catalyst under hydrogenating conditions.

4,954,655

PREPARATION OF ALKYLHYDRAZINES

Martha J. Kelly, Norristown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 31, 1989, Ser. No. 331,925

Int. Cl.[5] C07C *241/02*

U.S. Cl. 564—464 15 Claims

1. A process for preparing an alkylhydrazine of the formula

$$H[N]_2NNHCR^1R^2CHR^3R4$$

which comprises reacting hydrazine and an alkene of the formula

$$R^1R^2C{=}CR^3R^4$$

wherein

R^1 is (C_1–C_4) alkyl;
R^2 is (C_1–C_4) alkyl, (C_2–C_4) alkenyl, (C_2–C_4) alkynyl or phenyl;
R^3 is hydrogen, (C_1–C_4) alkyl, (C_2–C_4) alkenyl or (C_2–C_4) alkynyl; or R^1 and R^2 together or R^2 and R^3 together respectively form a cycloalkyl group; and
R^4 is hydrogen, (C_1–C_4) alkyl, (C_2–C_4) alkenyl or (C_2–C_4) alkynyl; in the presence of an acid catalyst.

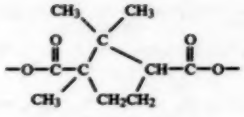
4,954,656

ESTER-TYPE POLYMERIC PEROXIDES

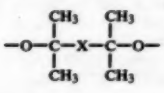
Shuji Suyama, and Yoshiki Higuchi, both of Chita, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Feb. 14, 1990, Ser. No. 480,037
Claims priority, application Japan, Feb. 22, 1989, 1-40394
Int. Cl.[5] C07C 179/18
U.S. Cl. 568—567 **1 Claim**

1. A polymeric peroxide consisting of a combination of structural unit represented by the following general formula (I) and structural unit represented by the following general formula (II):

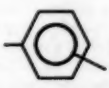


(I)



(II)

(where X is $-CH_2CH_2-$ group, $-C\equiv C-$ group or



group)

and having an average molecular weight of 2000–20000, in which said structural units I and II are randomly bonded in form of head-to-head and head-to-tail bonds and a mol ratio of structural unit I to structural unit II is 6:4–4:6.

4,954,657

PROCESS FOR THE PREPARATION OF O-NITROPHENETOLE

Hartmut Heise, Bad Soden am Taunus, and Manfred Hintzmann, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 4, 1988, Ser. No. 267,170
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737919
Int. Cl.[5] C07C 43/00
U.S. Cl. 568—584 **11 Claims**

1. In the process for the preparation of o-nitrophenetole by the reaction of o-nitrochlorobenzene with ethanol in the presence of a phase-transfer catalyst in an aqueous alkali metal hydroxide solution, the improvement which comprises reacting 1.05 to 1.4 mole of ethanol per mole of o-nitrochlorobenzene in 40 to 70 percent by weight alkali metal hydroxide solution at temperatures ranging from 50° to 80° C., ethanol being present throughout the reaction with the o-nitrochlorobenzene but said ethanol being maintained at a concentration not greater than 1.5 per cent by weight throughout said reaction.

4,954,658

PROCESS FOR REDUCING FLUORIDE LEVELS IN POLY(TETRAMETHYLENE ETHER) GLYCOL

Suriyanarayanan Dursi, Lockport, N.Y., and Richard E. Ernst, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 195,911, May 19, 1988, abandoned. This application Sep. 14, 1989, Ser. No. 407,067
Int. Cl.[5] C07C 37/72, 37/70
U.S. Cl. 568—617 **20 Claims**

1. In a process for preparing poly(tetramethylene ether) glycol (PTMEG) by polymerizing tetrahydrofuran in the presence of fluorosulfonic acid, hydrolyzing the resulting sulfate esters, washing and neutralizing the resulting acidic PTMEG composition so as to provide an aqueous PTMEG containing between about 80 and 600 ppm of fluoride, the improvement comprising heating said aqueous fluoride-containing PTMEG to a temperature in the range between about 200 and 300° C. for a period of time sufficient to reduce the fluoride content of said PTMEG.

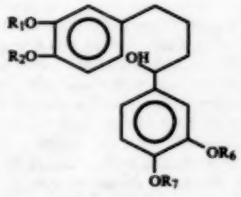
4,954,659

1,4-BIS (DIHYDROXYPHENYL) BUTANE AND ANALOGS

Robert M. Parkhurst, Redwood City, and Ronald S. Pardini, Reno, both of Nev., assignors to Chemex Pharmaceuticals, Inc., Denver, Colo.

Continuation of Ser. No. 112,042, Oct. 21, 1987, abandoned, which is a continuation of Ser. No. 946,659, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 436,425, Oct. 25, 1982, abandoned. This application Aug. 19, 1988, Ser. No. 235,708
Int. Cl.[5] C07C 43/164, 39/12, 33/26
U.S. Cl. 568—651 **35 Claims**

1. A compound selected from the group consisting of compounds of the formula:



where R_1 and R_2 and R_6 and R_7 may be lower alkyl, C2–C6 alkenyl, an aromatic substituent containing up to three carbon containing aromatic rings and may contain sulfur or nitrogen, C7–C14 aralkyl or C7–C14 aralkenyl, or R_1 and R_2 and R_6 and R_7 taken together form a lower alkylene radical, or R_6 and R_7 are H.

4,954,660

PROCESS FOR THE DIRECT HYDRATION OF LINEAR OLEFINS

Giuseppe Messina, Alghero; Carmelo Nurra, Olmedo; Oscar Cappellazzo, Alghero; Angelo Virdis, Usini, and Lorenzo Lorenzoni, Porto Torres, all of Italy, assignors to Enichem Anic S.p.A., Palermo, Italy

Filed Oct. 28, 1988, Ser. No. 264,035
Claims priority, application Italy, Oct. 29, 1987, 22450 A/87
Int. Cl.[5] C07C 27/00, 29/04, 41/06
U.S. Cl. 568—697 **11 Claims**

1. A process for preparing secbutyl alcohol and methyl t-butyl ether, which comprises:

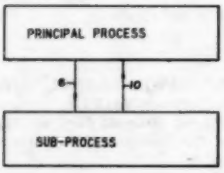
reacting butene-1 or butene-2 in the presence of methyl alcohol and t-butyl alcohol with an acidic catalyst selected from the group consisting of acids supported on an inert

carrier, acidic resins, and heteropolyacids at a temperature of 120° to 200° C.

4,954,661
PROCESS FOR PREPARING HIGH-PURITY BISPHENOL A

Shigeru Iimuro; Yoshio Morimoto, and Takashi Kitamura, all of Aichi, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,218
Claims priority, application Japan, Mar. 11, 1988, 63-56335; Mar. 16, 1988, 63-60277
Int. Cl.[5] C07C *37/20, 37/84, 39/16*
U.S. Cl. 568—727 **10 Claims**



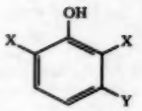
1. A method for preparing high-purity bisphenol A comprising a principal process which comprises the steps of (1) reacting phenol with acetone at a temperature of 40 to 90° C. of an acid catalyst which catalyzes the reaction of phenol and acetone to form bisphenol A to obtain a first reaction solution, (2) removing a part of the phenol and/or the catalyst and water from the first reaction solution to form a first concentration adjusted solution, (3) cooling the first concentration adjusted solution to obtain a first slurry containing an adduct of bisphenol A with phenol, (4) subjecting the first slurry to solid-liquid separation to form primary crystals and a first mother liquor and (5) removing phenol from the first crystal to obtain bisphenol A; and a sub-process which comprises the steps of (6) reacting p-isopropenylphenol with phenol in the presence of an acid catalyst to form a second reaction solution, (7) removing a part of the phenol and/or the catalyst and water from the second reaction solution to form a second concentration adjusted solution, (8) cooling the second concentration adjusted solution to obtain a second slurry, (9) subjecting the second slurry to solid-liquid separation to obtain secondary crystals and a second mother liquor and (10) treating the second mother liquor to obtain p-isopropenylphenol and phenol, the first mother liquor from the principal process being fed to the sub-process and the secondary crystals from the sub-process being fed to the principal process.

4,954,662
SELECTIVE CHLORINATION OF ORTHO-SUBSTITUTED PHENOLS

Jean-Roger Desmurs, Saint-Symphorien d'Ozon; Bernard Besson, Pont de Claix, and Isabelle Jouve, Villeubanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 18, 1988, Ser. No. 220,254
Claims priority, application France, Jul. 17, 1987, 87 10417
Int. Cl.[5] C07C *37/62, 39/24*
U.S. Cl. 568—779 **18 Claims**

1. A process for the selective chlorination of an ortho-substituted phenolic compound having the formula (I):



(I)

in which:

the symbols X, which may be identical or different, are each a chlorine atom, a bromine atom, a methyl or ethyl group, a methoxy or ethoxy group, an acetoxy group, an NO_2 group or an acylamino group having 1 to 4 carbon atoms, and

the symbol Y is a hydrogen atom, a methyl or ethyl group, a methoxy or ethoxy group, comprising conducting said selective chlorination with gaseous chlorine, in the presence of a selectivity-enhancing effective amount of at least one organic cation comprising an onium ion derived from nitrogen, phosphorus, arsenic, sulfur, selenium, oxygen, carbon or iodine and which is coordinated with a hydrocarbon moiety.

4,954,663
PROCESS FOR PREPARING LONG CHAIN ALKYL PHENOLS

David O. Marler, Deptford, and John P. McWilliams, Woodbury, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation-in-part of Ser. No. 254,524, Oct. 6, 1988, which is a continuation-in-part of Ser. No. 98,176, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 890,268, Jul. 29, 1986, abandoned. This application Jan. 25, 1990, Ser. No. 470,015
Int. Cl.[5] C07C *37/11*
U.S. Cl. 568—791 **23 Claims**

1. A process for the production of a relatively long chain alkyl-substituted phenolic compounds which comprises contacting at least one alkylatable phenolic compound with at least one alkylating agent possessing an alkylating aliphatic group having at least six carbon atoms under alkylation reaction conditions and in the presence of an alkylation catalyst to provide an alkylated phenol possessing at least one alkyl group derived from said alkylating agent, said catalyst comprising a synthetic porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table A of the specification.

4,954,664
PROCESS FOR THE DIRECT HYDROGENATION OF BUTTERFAT

Franz-Josef Carduck, Haan; Juergen Falbe, Neuss; Theo Fleckenstein, Hilden; Gerd Goebel, Erkrath, and Joachim Pohl, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 166,956, Mar. 11, 1988, abandoned. This application Jan. 25, 1990, Ser. No. 470,428
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708430
Int. Cl.[5] C07C *27/00*
U.S. Cl. 568—864 **21 Claims**

1. A process for the direct catalytic hydrogenation of butterfat which comprises:

A. continuously reacting non-deacidified butterfat with hydrogen under pressures of from about 20 to about 300 bar and at temperatures of from about 180° to about 250° C. with molar ratios of hydrogen to fatty acid residues in the butterfat of from about 10 : 1 to about 500 : 1, the reaction being carried out in the presence of a catalyst which contains from about 30 to about 40% by weight copper, from about 23 to about 30% by weight chromium,

from about 1 to about 10% by weight manganese, from about 1 to about 10% weight silicon and from about 1 to about 7% by weight barium, the percentages by weight being based on the total weight of the catalyst, to form a reaction product containing fatty alcohols, oxo- and hydroxyfatty alcohols corresponding to the butterfat composition and propylene glycol, and;

B. separating the reaction products from residue.

4,954,665

METHANOL HOMOLOGATION

Jose' L. Vidal, Kanawha, W. Va., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Continuation of Ser. No. 795,725, Nov. 7, 1985, abandoned, which is a continuation of Ser. No. 653,050, Sep. 21, 1984, abandoned. This application Aug. 27, 1986, Ser. No. 900,275

Int. Cl.[5] C07C *29/34*

U.S. Cl. 568—902.2 **2 Claims**

1. An improved process for the production of ethanol by the reaction of methanol with synthesis gas in contact with a homogeneous catalyst system consisting of cobalt, ruthenium, iodine and an alkali metal at a pressure of from 2,000 psig to 10,000 psig and a temperature of from about 180° to about 210° C., wherein the mole atom ratio of Co:Ru is from 3:1 to 7:1, the mole ratio of alkali metal atom M:Ru is from 2:1 to 20:1 and the mole atom ratio of I:Ru is from 3:1 to 27:1, the concentration of cobalt in the reactor 0.013 is from to 0.15 mole per liter, the concentration of ruthenium in the reactor is from 0.025 to 0.035 mole per liter, the concentration of iodine in the reactor is from 0.026 to 0.6 mole per liter, the concentration of alkali metal in the reactor is from 0.7 to 0.6 mole per liter, and the source of the alkali atom being sodium iodide, sodium bicarbonate or sodium tetraborate.

2. An improved process for the production of ethanol by the reaction of methanol with synthesis gas in contact with a homogeneous catalyst system consisting of cobalt, ruthenium, iodine, at least one organic amine and at least one alkali metal at a pressure of from 2,000 psig to 10,000 psig and a temperature of from about 180° to about 210° C., wherein the mole atom ratio of Co:Ru is from 3:1 to 7:1, the mole ratio of alkali metal atom M:Ru is from 2:1 to 20:1 and the mole atom ratio of I:Ru is from 3:1 to 27:1, the concentration of cobalt in the reactor is from 0.013 to 0.15 mole per liter, the concentration of ruthenium in the reactor is from 0.025 to 0.035 mole per liter, the concentration of iodine in the reactor is from 0.026 to 0.6 mole per liter, the concentration of alkali metal in the reactor is from 0.7 to 0.6 per liter, the source of the alkali atoms being sodium iodide, sodium bicarbonate or sodium tetraborate, the catalyst system containing from 0.02 to 0.04 mole per liter of an organic amine, and the organic amine being selected from the group consisting of trimethylamine, triethylamine, tri-n-butylamine, tri-t-butylamine, tri-2-ethylhexylamine, methyl dibutylamine, tridodecylamine, tristearylamine, ethyl dibutylamine, tricyclohexylamine, triphenylamine, tri(4-methoxyphenyl)-amine, tri(p-chlorophenyl)-amine, dibutyl phenylamine, diphentyl cyclopentylamine, ethyl diphenylamine, trinaphthylamine, tri-p-tolylamine, tri-benzylamine, tri(3-methylcyclohexyl)amine, and a mixture of two or more of said organic amines.

4,954,666

PROCESS FOR PREPARING FLUORINATED C_4 TO C_6 HYDROCARBONS AND NOVEL CYCLIC FLUORINATED HYDROCARBONS AND THEIR USE AS PROPELLANT GAS AND WORKING FLUID FOR HEAT PUMP SYSTEMS

Dietmar Bielefeldt, Ratingen; Albrecht Marhold, Leverkusen, and Michael Negele, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 257,351, Oct. 13, 1988, Pat. No. 4,902,839. This application Dec. 21, 1989, Ser. No. 454,577

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, 3735467

Int. Cl.[5] C07C *19/02, 23/08, 17/24, 17/00*

U.S. Cl. 570—132 **3 Claims**

1. A compound of the formula

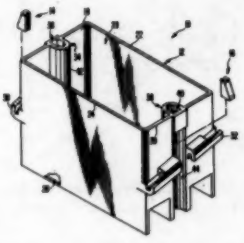
wherein the two R/ groups taken together are —CF_2—CF_2—CF_2—or $CH(CF_3)$—$CH(CF_3)$—.

ELECTRICAL

4,954,667
ELECTRICAL BOX WITH COUPLING MEMBERS

Robert W. Jorgensen, Niles, Mich., and Kenneth R. Schnell, South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Feb. 15, 1989, Ser. No. 311,334
Int. Cl.[5] H02G 3/08
U.S. Cl. 174—53 8 Claims



6. A coupling member adapted to be positioned in an opening formed in an electrical box, the combination comprising:

a body portion having a curved face portion and a downwardly and outwardly sloping face portion opposed to said curved face portion; and

a head portion coupled to said body portion and having a first shoulder extending outwardly therefrom in the same direction as said sloping face portion, and second and third shoulders extending outwardly from said head portion on opposite sides of said first shoulder, said first, second and third shoulders forming a continuous shoulder,

whereby, upon insertion of said coupling member into the opening, said shoulders will engage corresponding ledges formed in the opening for mounting and retaining said coupling member within the opening.

4,954,668
APPARATUS FOR RESETTING APPLIANCE

Yuji Sako, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

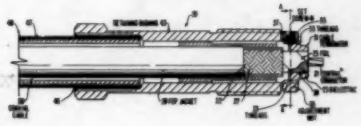
Continuation of Ser. No. 923,881, Oct. 28, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 224,221
Claims priority, application Japan, Dec. 13, 1985, 60-190965[U]
Int. Cl.[5] H01H 9/00
U.S. Cl. 200—314 4 Claims

1. In a resetting apparatus having an inner cable with first and second ends, said first end including an end member for contacting a reset button of an appliance mounted inside a control panel, said second end being connected to a push button protruding outside said control panel, and an outer cable enveloping said inner cable, said outer cable being fixed at one end to said control panel and to said appliance at the other end thereof, said reset button being depressed by said end member when said push button is depressed, the improvement comprising a light emitting means mounted in said reset button for indicating an operation mode of said appliance, and said inner cable including a flexible portion extending between said end member and said second end, said flexible portion being made of an optical conductor, said optical conductor being housed within said end member said end member having an aperture for transmitting light from said light emitting means to said optical conductor, whereby light emitted from said light emitting means is directed towards said push button.

4,954,669
COAXIAL CABLE CONNECTOR ASSEMBLY

Harmon W. Banning, Derwood, Md., and Daniel C. Neil, Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jan. 25, 1989, Ser. No. 301,575
Int. Cl.[5] H02G 15/02
U.S. Cl. 174—75 C 9 Claims



1. A coaxial cable and terminator comprising:

(a) A coaxial cable further comprising:

1. a central conductor,
2. a layer of dielectric material surrounding said central conductor,
3. at least one layer of foil as an outer conductor surrounding said dielectric material,
4. a braid of metallic material surrounding said outer conductor, and

(b) a cable terminator having smooth inner surfaces and a void space capable of receiving an end of said coaxial cable, said terminator rigidly attached to the braid and foil, and

(c) a jacket further surrounding substantially all of the braid of said coaxial cable and which abuts said cable terminator.

4,954,670
CABLE SPLICE CASE

Michael L. Jensen, Overijse; Jean-Marie E. Nolf, Hamme-Mille; Jan Vansant, Leuven, and Luiz N. Mendes, Begijnendijk, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 18,221, Feb. 24, 1987, abandoned. This application Nov. 9, 1988, Ser. No. 274,722
Claims priority, application United Kingdom, Feb. 24, 1986, 8604501
Int. Cl.[5] H02G 15/08
U.S. Cl. 174—92 19 Claims

1. An article for environmentally protecting an elongated substrate, which comprises:

a first sheet having a first edge portion;

a second flexible substantially planar sheet having a second edge portion;

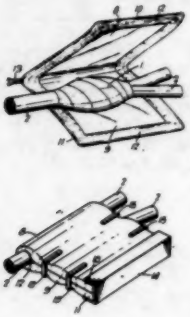
a heat-activatable sealing material that can be positioned between the first and second edge portions;

means for displacing the sealing material to form a seal between the first and second edge portions and around the substrate; and

a substantially rigid casing that can surround the first and second sheets when the first and second sheets enclose the substrate, said casing includes a hole in the casing so that a rod or plate can protrude through the hole and hold the first and second edge portions together around the substrate.

16. A substantially rigid casing suitable for surrounding a branched cable splice enclosed by first and second sheets, said casing having means operable from outside the casing for bringing together the first and second sheets between the

branching cables wherein the means operable from the outside comprises a hole or opening through which a plate or rod can



be inserted to bring together first and second sheets between the branching cables.

4,954,671

CONNECTIBLE SWITCHING DEVICE

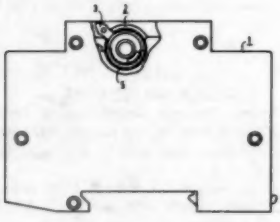
Hass Schmidt, Regenstauf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 14, 1989, Ser. No. 323,347

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1988, 3808472

Int. Cl.[5] H01H *9/20, 3/58*

U.S. Cl. 200—50 C **2 Claims**



1. A switching device in a system having a plurality of switching devices, said switching device being coupled to mountable switching, auxiliary switching or signal devices, said switching device comprising a housing, a cylindrical, manually operated part disposed in the housing and having a switching axis, a manually operable selector attached to the cylindrical part, the cylindrical part having two coupling directions determined by movement of said selector, and further comprising a coupling element pair comprising a jaw-shaped coupling element and a cone-shaped coupling element, one of said jaw-shaped coupling element and cone-shaped coupling element being disposed on the cylindrical part in the direction of the switching axis, the jaw-shaped and cone-shaped coupling elements being in engagement, the jaw-shaped coupling element having a jaw tooth, said jaw tooth being in engagement depth only for one coupling direction of the cylindrical part at a shallow penetration by the cone-shaped coupling element into the jaw-shaped coupling element and said jaw tooth being in engagement depth for both coupling directions at a deep penetration by the cone-shaped coupling element into the jaw-shaped coupling element.

4,954,672

GROUND START KEY SWITCH

William E. Ruehl, Wheeling, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Mar. 30, 1989, Ser. No. 330,774

Int. Cl.[5] H01R *33/96*

U.S. Cl. 200—51.09 **22 Claims**

1. A ground start key switch for use with a modular duplex adapter to permit shorting momentarily a pair of jack terminals comprising:

switch actuator means adapted to be mounted onto a modular duplex adapter having a pair of jack terminals;

conductor means attached to said switch actuator means; and

said switch actuator means including a resilient lever arm being depressible for causing engagement of said conductor means with said pair of jack terminals so as to electrically short said pair of jack terminals together, said lever arm causing disengagement of said conductor means with said pair of jack terminals when released.

4,954,673

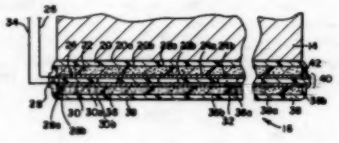
HIGHLY SENSITIVE SWITCH FOR ACTUATION OF A DEVICE UPON FORCE BEING APPLIED THERETO

Norman K. Miller, Concordville, Pa., assignor to Miller Edge, Inc., Concordville, Pa.

Filed Jul. 21, 1989, Ser. No. 384,348

Int. Cl.[5] H01H *3/16*

U.S. Cl. 200—61.43 **14 Claims**



1. A highly sensitive switch for actuating of a device upon force being applied to said switch, said switch comprising:

a first layer of non-conducting material for attachment to a surface, said first layer of material having a first face and a second face;

a first sheet of resiliently compressible material having a first face and a second face, said first face of said first sheet of resiliently compressible material being in engagement with said second face of said first layer of material;

a first sheet of flexible, electrically conductive material having a first face and a second face, said first face of said first sheet of flexible, electrically conductive material being in engagement with said second face of said first sheet of resiliently compressible material;

a second layer of non-conductive material having a first face and a second face, said first face of said second layer of material being in engagement with said second face of said first sheet of flexible, electrically conductive material, said second layer of non-conductive material including at least one opening extending therethrough between said first

and second faces thereof, said first and second layers of non-conducting material being constructed of the same material;

a second sheet of flexible, electrically conductive material having a first face and a second face, said first face of said second sheet of flexible, electrically conductive material being in engagement with said second face of said second layer of non-conductive material;

a second layer of resiliently compressible material having a first face and a second face, said first face of said second sheet of resiliently compressible material being in engagement with said second face of said second sheet of flexible, electrically conductive material;

a third layer of non-conductive material having a first face and a second face, said first face of said third layer of non-conducting material being in engagement with the second face of said second sheet of resiliently compressible material, said third layer of non-conducting material being constructed of the same material as said first and second layers of non-conducting material, said first and second sheets of flexible, electrically conductive material being spaced apart by said second layer of non-conductive material and present opposed portions to each other through said opening whereby upon the application of force to said switch, a portion of said first sheet of flexible electrically conductive material deflects into the opening in said second layer of non-conducting material and into contact with a portion of said second sheet of flexible, electrically conductive material to thereby actuate the device.

4,954,674

MATRIX CROSSPOINT SWITCHING DEVICE

Sture G. Roos, Bergshamra, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

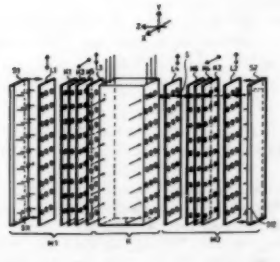
PCT No. PCT/SE88/00452, § 371 Date May 10, 1989, § 102(e) Date May 10, 1989, PCT Pub. No. WO89/02650, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 2, 1988, Ser. No. 354,432

Claims priority, application Sweden, Sep. 10, 1987, 8703521

Int. Cl.[5] H01H *1/16, 67/26*

U.S. Cl. 200—175 **12 Claims**



1. A matrix crosspoint switching device for making, breaking or switching contacts between a plurality of first conductor pairs and a plurality of second conductor pairs, conductors in first sets of said first pairs and conductors in first sets of said second pairs forming a first matrix of crosspoints and conductors in second sets of said first and second pairs forming a second matrix of crosspoints, each of said crosspoints in said first and second matrices including a contact area in a connection block, said connection block including a plurality of cavities extending from one side of said connection block to the opposite side of said connection block, the crosspoints of said first matrix occupying first end spaces of said cavities and the crosspoints of said second matrix occupying second opposite end spaces of said cavities on either side of the symmetry axis of said connection block, a first and a second pair of roller elements movably disposable within each cavity, one of said roller elements in each pair being electrically conductive while the other one is non-conductive, such that said one element in each pair is able to achieve electrically conductive contact when moved into contact with a contact area and such that said other element in said pair is unable to achieve electrically conductive contact when moved into contact with a contact area;

the device further including control means for controlling the movements of said roller elements, sand control means including on each side of said connection block first and second positioning means for positioning said roller elements in front of said cavities, a first and a second plurality of apertured combination plate means, and actuation means to actuate predetermined ones of said roller elements based on the relative positions of said combination plate means to attain a selective connection or disconnection of determined crosspoints in said first and second matrices.

4,954,675

SWITCH OPERATION INDICATOR

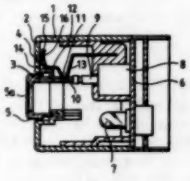
Masayosi Iwata; Toshiya Muto; Minoru Morikawa; Satoshi Kozawa; Akihiko Takase, and Naoki Terano, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Sep. 14, 1988, Ser. No. 244,373

Claims priority, application Japan, Sep. 18, 1987, 62-143505[U]; Sep. 18, 1987, 62-143506[U]

Int. Cl.[5] H01H *9/16*

U.S. Cl. 200—317 **3 Claims**



1. A switch operation indicator comprising a frame fitted with a push-type switch having a drive member locked into a pressed-in position by a first pressing-in action and unlocked and returned to an original position by the next pressing-in action; a push button fitted in said frame so that said push button can be pressed in; a coupling bar for coupling said push button and said drive member to each other and having an operating notched portion; an indication opening provided in said frame adjacent to said button; and an indication member attached to said frame and shaped in complementary fashion with respect to said notched portion to respond to said pressing-in actions to be engaged with or disengaged from said notched portion, said indication member having an indicating portion which swings to face said opening upon the first pressing-in action and swings back to not face said opening upon the next pressing-in action.

4,954,676

ELECTRICALLY HEATED STUFFED TOY WITH CONCENTRATED HEAT DISSIPATION

Martin D. Rankin, Roleystone, Australia, assignor to Axti Pty Ltd., Mt. Hawthorn, Australia

Filed Jan. 14, 1988, Ser. No. 144,561

Claims priority, application Australia, Jan. 15, 1987, PH9686

Int. Cl.[5] H05B *3/00*; A61F *7/08*

U.S. Cl. 219—200 **17 Claims**

1. A heating means to be used by a person and held against the person's body for warmth comprising a soft flexible body

having a flexible outer casing, a stuffing material substantially filling said outer casing, said outer casing and said stuffing material defining a cavity adjacent a portion of said outer body and extending into and surrounded by said stuffing material, a heat source within said outer casing and supported within and by said stuffing material at a base of said cavity spaced from said outer casing portion, and a flexible heat transfer means

within said cavity, said flexible heat transfer means having a first portion engaged with said heat source and a spaced portion engaged with said portion of said outer casing of said body for transferring heat thereto from said heat source, the remaining portion of said heat transfer means not engaged with said heat source or with said outer casing portion being surrounded by said stuffing material, said heat transfer means being of higher thermal conductivity than said stuffing material.

4,954,677

TIRE PRESSURE SENSOR FOR MOTOR VEHICLES

Günther Alberter, Nuremberg; Helmut Deeg, Zirndorf; Gerhard Hettich, Dietenhofen; Klaus Neidhard, Wendelstein; Hans-Dieter Schmid, Nuremberg, and Hans Schrumpf, Oberasbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

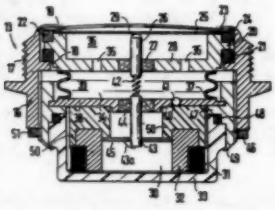
PCT No. PCT/DE87/00341, § 371 Date Apr. 21, 1989, § 102(e) Date Apr. 21, 1989, PCT Pub. No. WO88/03879, PCT Pub. Date Jun. 2, 1988

PCT Filed Aug. 4, 1987, Ser. No. 347,775

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639688

Int. Cl.[5] H01H *35/32*

U.S. Cl. 200—834 **12 Claims**



1. A tire pressure sensor to be fastened to a rim of a vehicle wheel for sensing an inflation pressure of a tire mounted on the rim, said pressure tire sensor comprising reference pressure chamber means having a filled reference pressure volume and including a reference pressure chamber for monitoring the tire inflation pressure; an electrically conductive diaphragm sealingly separating said reference pressure chamber from a tire interior; a sensor electric circuit is said sensor; a contact pin located in said reference pressure chamber and removably contacting said electrically conductive diaphragm for closing said sensor electric circuit when the tire inflation pressure is at a predetermined value; and means defining a deformable portion of the reference pressure chamber means and enclosing at least partially said reference chamber volume, and means other than the tire pressure for deforming said deformable portion to thereby change said reference chamber volume and establish a predetermined reference pressure in said reference pressure chamber.

4,954,678

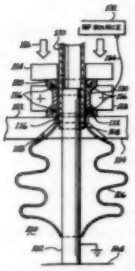
ANNULAR RF SEALER AND METHOD

Daniel C. Harmony; John B. Gummere, and Stephen C. Mianey, all of Tucson, Ariz., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.

Filed Jun. 6, 1988, Ser. No. 202,317

Int. Cl.[5] H05B *6/54*

U.S. Cl. 219—10.43 **13 Claims**



1. A method of sealing with RF energy a length of tubing; said method comprising the steps of:

(a) locating a first electrode within the length of tubing;

(b) circumstribing the length of tubing with a second electrode;

(c) radially compressing the length of tubing to effect a closure of the tubing; and

(d) radiating RF energy between the first and second electrodes to heat the tubing; accommodate compression of the tubing and seal the closure.

4,954,679

METHOD FOR THE RAPID THAWING OF CRYOPRESERVED BLOOD, BLOOD COMPONENTS, AND TISSUE

Frank M. Harms, Marietta; Victor Tripp, Tucker, and Thomas B. Wells, Smyrna, all of Ga., assignors to Lifeblood Advanced Blood Bank Systems, Inc., Atlanta, Ga.

Division of Ser. No. 292,574, Dec. 30, 1988, Pat. No. 4,874,915. This application Jul. 24, 1989, Ser. No. 384,564

Int. Cl.[5] H05B *6/64*

U.S. Cl. 219—10.55 M **7 Claims**

1. A method for thawing a container of frozen plasma, comprising the steps of:

surrounding a container of frozen plasma with a dielectric medium having a dielectric constant substantially similar to the dielectric constant of frozen plasma;

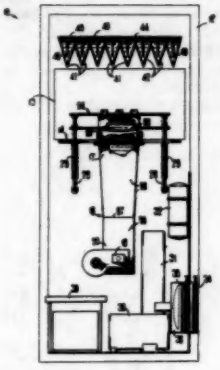
generating microwaves;

guiding said generated microwaves to propagate through said dielectric medium in the direction of said container of frozen plasma;

dispersing said microwaves propagating through said dielectric medium across an area of predetermined size which encompasses said container of frozen plasma; and

supporting multiple odd-numbered harmonic modes of prop-

agation of said microwaves such that the cumulative effect of said multiple harmonic modes creates an approxi-



mately uniform electromagnetic field across said area of predetermined size which encompasses said container of frozen plasma.

4,954,680

HIGH FREQUENCY HEATING APPARATUS HAVING SEALABLE AND DETACHABLE MOUNTING ROCK

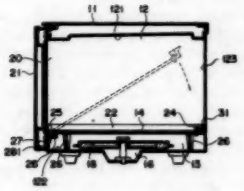
Shinji Takenouchi, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1989, Ser. No. 380,453

Claims priority, application Japan, Jul. 26, 1988, 63-184705

Int. Cl.[5] H05B *6/76*

U.S. Cl. 219—10.55 E **18 Claims**



1. A high frequency heating apparatus comprising:

a housing including a heating chamber having an opening at one end, a door for exposing/closing said opening of said heating chamber, and means for supplying a heating high frequency output from a bottom portion of said hearing chamber to the inside of said heating chamber;

a mounting rack for partitioning said bottom portion of said heating chamber from an upper portion thereof, and for supporting an object to be heated, said mounting rack having engaging portions engaged with a lower edge of said opening of said heating chamber, by means of which said mounting rack can pivot about said engaging portions and be detached from said lower edge, and having recesses respectively formed on lower surfaces of edges opposite to wall surfaces, except for said opening; and

sealing means for sealing a gap between a wall surface of said heating chamber and an opposing edge of said mounting rack, said sealing means having a projection fitted in a corresponding one of said recesses of said mounting rack, a base portion formed integral with said projection and brought into tight contact with each of said opposite edges of said mounting rack, and a tongue formed integral with said base portion and urged against a corresponding one of the wall surfaces of said heating chamber and creating a sealed contact therewith.

4,954,681

DRYING AND CRYSTALLIZING APPARATUS FOR GRANULES, WHICH EMPLOYS A MICROWAVE DEVICE

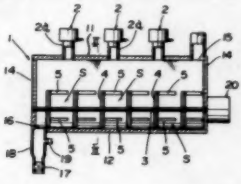
Kanzo Ishikawa, Uji; Ryutaro Hayashi, Mino, and Akira Yoshimoto, Sakai, all of Japan, assignors to Kawata Co., Ltd., Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 330,783

Claims priority, application Japan, May 31, 1988, 63-134895; Jun. 30, 1988, 63-164177

Int. Cl.[5] H05B *6/78*; B29B *13/08*

U.S. Cl. 219—10.55 A **7 Claims**



1. A drying and crystallizing apparatus for granules, comprising:

(a) a heating tank formed in the shape of a rectangular parallelepiped having at one lengthwise side thereof a material inlet and at its other lengthwise side a material outlet,

(b) a plurality of microwave units for radiating microwaves on said granules charged into said heating tank through said material inlet, and

(c) an agitating unit housed in said heating tank for agitating said granules, comprising a plurality of spaced-apart disc-like partitions for providing in said heating tank a plurality of partitioned spaces between adjacent disc-like partitions across said material inlet and said material outlet, a driving shaft for supporting said partitions so as to rotate them, and agitating vanes mounted on each of said partitions so as to agitate said granules in each of said partitioned spaces and transfer said granules from one partitioned space successively into adjacent partitioned spaces in the direction of the material outlet side.

4,954,682

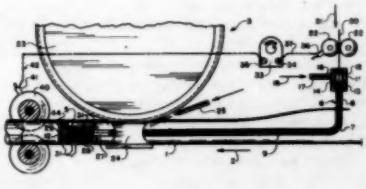
INTERNAL WELD BEAD METALLIZING SYSTEM AND METHOD

Ireneusz W. Baran, Chicago, and Humberto A. Hijuelos, East Hazelcrest, both of Ill., assignors to Maneely-Illinois, Inc., Chicago, Ill.

Filed May 1, 1989, Ser. No. 345,683

Int. Cl.[5] B23K *9/04*

U.S. Cl. 219—76.14 **8 Claims**



1. A system for continuously coating a weld bead on an

inside diameter of a tube being continuously formed from flat strip comprising:

a hollow lance extending into the tube being formed and terminating in a coating head positioned downstream from but adjacent to a welding electrode producing the weld bead, which joins abutted side edges of the strip together to complete the tube;

the coating head having a coating passage therethrough directed toward the weld bead and further having port mean therethrough for head support purposes;

means to continuously direct coating material through the lance and coating passage of the coating head to the weld bead area for coating the inside diameter of the weld bead; and

means to continuously pass inert gas under pressure through the lance and port means in the coating head to form an inert gas cushion within the tube about the coating head to support the coating head within and in spaced relationship from the tube.

4,954,683

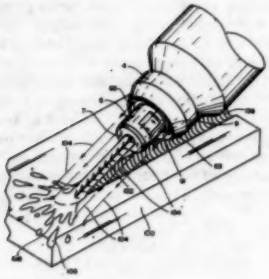
PLASMA ARC GOUGER

Bruce O. Hatch, Lebanon, N.H., assignor to Thermal Dynamics Corporation, West Lebanon, N.H.

Filed May 26, 1989, Ser. No. 358,416

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.5 **12 Claims**



1. A front end assembly for a plasma arc torch utilizing an electrode, a plasma gas stream and a secondary gas stream comprising:

a. a tip for gouging having:

i. an elongated barrel with a first end and a second end;

ii. said first end forming a hollow recess sized to enclose a portion of said electrode; and

iii. said second end forming an orifice for the passage of said plasma gas stream;

b. a secondary gas nozzle for gouging having:

i. a central aperture in said nozzle sized to allow said tip to extend through said central aperture;

ii. a peripheral passageway directing said secondary gas stream in a blanket about said tip and said plasma gas stream as it exits said orifice; and

iii. a radial abutment blocking a portion of said peripheral passageway to restrict said blanket and prevent complete enrichment of said plasma gas stream.

4,954,684

VERTICAL TYPE HEAT-TREATING APPARATUS AND HEAT-TREATING METHOD

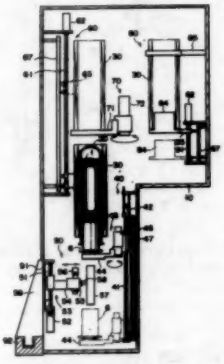
Kazutsugu Aoki, Sagamihara; Noboru Fuse, Yokohama, and Yoshio Sakamoto, Machida, all of Japan, assignors to Tel Sagami Limited, Kanagawa, Japan

Filed Feb. 23, 1989, Ser. No. 313,904

Claims priority, application Japan, Feb. 26, 1988, 63-45059; Feb. 26, 1988, 63-45061

Int. Cl.[5] F27B *5/14*; F27D *11/02*; H05B *3/62*

U.S. Cl. 219—390 **8 Claims**



1. A vertical type heat-treating apparatus comprising;

a process tube, disposed vertically in a lengthwise direction thereof, for receiving a support mounting target objects for treatment and treating said target objects under a predetermined condition;

heating means, disposed around said process tube at a time a heat treatment is effected, for heating said target object within said process tube; and

position changing means for changing a relative position of said process tube and said heating means after the heat treatment is performed, by vertically moving said process tube or said heating means such that said process tube is set to a position out of said heating means,

wherein said position changing means has a moving device for moving said heating means, wherein said moving device has a vertical movement mechanism for vertically moving said heating means between a heat-treating position and a separating position located above said heat-treating position, and wherein said moving device further has a horizontal movement mechanism for moving said heating means between said separating position and a retreat position located sideways of said separating position.

4,954,685

HEATING FURNACE FOR SEMICONDUCTOR WAFERS

Hiromi Kumagai; Kaoru Sato, and Yoshio Imai, all of Tokyo, Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,343

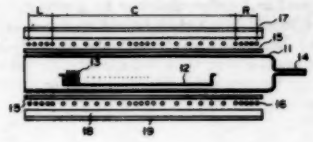
Claims priority, application Japan, Jul. 31, 1987, 62-191673; Oct. 28, 1987, 62-272403

Int. Cl.[5] F27B *5/14*

U.S. Cl. 319—390 **2 Claims**

2. A heating furnace for semiconductor wafers comprising a heating line which is coiled around a core tube and is 5–15% more densely coiled at that portion thereof which corresponds to the center of said core tube than at those portions thereof which are adjacent to the center of said core tube, its coiling density being varied along the longitudinal axis of the furnace in the order of intermediate density-low density-high density-

low density-intermediate density, layers of a heat insulating material or of ceramic fibers arranged around said heating line,



and at least one layer of a heat reflecting material being a thin film vapor deposited on the inner face of said heat insulating material.

4,954,686

HIGH SPEED RMS CONTROL APPARATUS FOR RESISTANCE WELDERS AND HIGH SPEED RMS CONTROL METHOD THEREOF

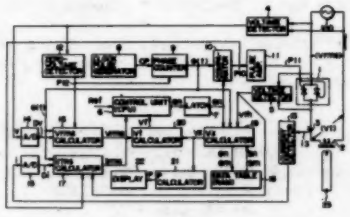
Takatomo Izume, Urawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1989, Ser. No. 342,885

Claims priority, application Japan, Apr. 25, 1988, 63-100272

Int. Cl.[5] B23K *11/24*

U.S. Cl. 219—110 **22 Claims**



1. A control apparatus for controlling a resistance welder which comprises a welding transformer, a primary winding of which is connected to an AC power supply and a secondary winding of which is connected to a welding gun, and a switching element inserted between said AC power supply and the primary welding of said welding transformer and fired at a predetermined firing phase, comprising:

storage means for calculating and storing a square sum SK wherein a sinusoidal wave $VK = K0 \sin\theta K$ having a predetermined peak value and corresponding to an AC component of said AC power supply is sampled at predetermined phase intervals θK within a predetermined phase range, square values VK^2 of the sinusoidal wave are calculated at each of the phase intervals θK, and square sum $SK = V1^2 + V2^2 + V3^2 \ldots + VK^2$ is calculated; and

Vx calculating means for reading out a value, Sn, of the square sum at the firing phase and a value, Sm, of the square sum at a phase upon completion of energization of said switching element from said storage means, and calculating a normalized effective value Vx obtained by normalizing an effective value of the AC power supply voltage on the basis of the readout square sums Sn and Sm;

control means using the normalized effective value Vx for controlling the application of a voltage to the primary winding of the welding transformer.

4,954,687

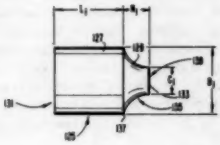
RESISTANCE WELDING ELECTRODE AND PROCESS

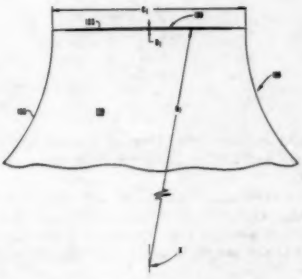
Arden W. Bush, Trafalger, and Everett E. Shirley, Lebanon, both of Ind., assignors to Contacts, Metals and Welding, Inc. a/k/a CMW, Inc., Indianapolis, Ind.

Filed Oct. 20, 1988, Ser. No. 260,196

Int. Cl.[5] B23K *9/24*

U.S. Cl. 219—119 **10 Claims**





1. A resistance welding electrode, comprising:

an electrically conductive metal body having a base portion, means for cooling said body, and an integral nose portion projecting from said base portion an axial nose length and terminating in a welding tip face, wherein said nose portion tapers inwardly between said base portion and said welding tip face with a concave profile taper, and wherein said welding tip face is fabricated to define a convex welding tip curvature, wherein said welding tip face has a face diameter, said face diameter and said welding tip curvature defining a crown height near the center of said welding tip face, wherein said crown height ranges between about 0.0015 and 0.003 inches, wherein said welding tip curvature has a general curvature between about a two inch and an eight inch radius of curvature, and wherein said welding tip curvature is a convex radius of curvature of about four inches, and wherein said nose portion of said body is made up of a conventional, non-dispersion strengthened copper material having copper combined with one or more metals selected from the group consisting of chromium, zirconium, cadmium, cobalt, nickel, beryllium, tungsten, aluminum, tungsten carbide, iron, and molybdenum.

4,954,688

PLASMA ARC CUTTING TORCH HAVING EXTENDED LOWER NOZZLE MEMBER

Duane N. Winterfeldt, Clinton, Iowa, assignor to ESAB Welding Products, Inc., Florence County, S.C.

Filed Nov. 1, 1989, Ser. No. 429,989

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.5 **11 Claims**

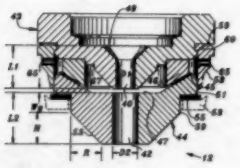
1. A plasma arc torch which is characterized by the ability to

provide beveled cuts while maintaining a relatively short standoff distance from a workpiece, and comprising

an electrode defining a discharge end and a longitudinal axis,

an upper nozzle member mounted adjacent said discharge end of said electrode and having a first bore therethrough of predetermined length L1 and which is aligned with said longitudinal axis,

a lower nozzle member mounted adjacent said upper nozzle member on the side thereof opposite said electrode and having a second bore therethrough of predetermined length L2 which is aligned with said longitudinal axis, said lower nozzle member comprising a cylindrical body portion defining a forward end portion and a rearward end portion and having said second bore extending coaxially therethrough and defining a bore diameter D2, an annular mounting flange positioned on said rearward end portion of said body portion, a frusto-conical surface formed on the exterior of said forward end portion so as to be coaxial



with said second bore and having a cone angle of between about 60° and 120°, an axial height H, and a radial dimension R,

means for creating an electrical arc extending from said discharge end of said electrode through said first and second bores and to a workpiece located adjacent the side of said lower nozzle member opposite said upper nozzle member,

means for generating a vortical flow of a gas between said electrode and said upper nozzle member and so as to create a plasma flow outwardly through said first and second bores and to said workpiece,

means for introducing a jet of liquid between said upper and lower nozzle members and so as to envelope said plasma as it passes through said second bore,

and wherein length L2 is at least as great as length L1, H is equal to at least about one half L2, L2 is between about 0.16 to 0.60 inches, and D2 is between 0.125 to 0.260 inches.

4,954,689

WELDING UNIT

Chalmers O. Smith, 825 Woodridge, Rochester, Mich. 48063

Filed Jul. 12, 1989, Ser. No. 379,351

Int. Cl.[5] B23K 9/12

U.S. Cl. 219—125.1 **12 Claims**

1. A multi-head, indexing weld unit comprising:

a plate-like base member;

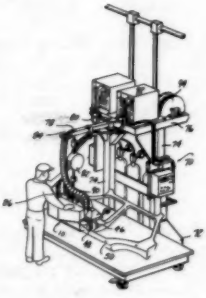
first and second slider assemblies, mounted to said base member, in spaced parallel relationship for movement axially along parallel axes;

rack and pinion means, disposed between, and fixedly mounted to said first and second slider assemblies to transfer linear motion of said first slider assembly along its respective axis to opposite motion of said second slider assembly, relative to said first assembly, along its respective axis;

motor means, fixed relative to said base member, attached to said first slider assembly, to drive said first slider assembly along its respective axis;

first and second welding units, mounted on said first and second slider assemblies respectively, having first and second welding heads extending outwardly from said units to terminate at predetermined locations, said first welding unit advanced along said first slider axis and said second welding unit retracted along said second slider axis;

said motor means actuable to move said first welding unit along said first slider assembly to a retracted position relative to said first slider axis and to move said second welding unit along said second slider assembly to an advanced position relative to said second slider axis thereby indexing said outwardly extending weld heads relative to each other.



9. A multi-head indexing weld unit, as defined in claim 1, each of said first and second welding units further comprising:

an automatic feed, gas metal arc (GMA) spot welding unit having means for continuously feeding welding rod to said welding head;

conduit means for delivery of inert gas to said welding head; and

electrical means for establishing a desired electrical potential at said weld head and in said workpiece during welding operations.

4,954,690

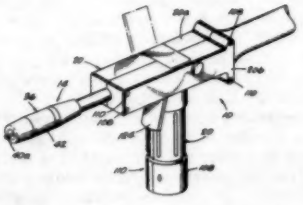
MODULAR WELDING GUN

Milo M. Kensrue, 49-320 Sunrose La., Palm Desert, Calif. 92260

Filed Apr. 3, 1989, Ser. No. 332,873

Int. Cl.[5] B23K 9/12

U.S. Cl. 219—137.31 **3 Claims**



1. A welding gun including,

an elongated mounting block made of an electrically conductive material and having a rear face, a central section, a front face, and a passageway extending through the block from the rear face to the front face,

drive means mounted in the central section for feeding welding wire entering the gun at the rear face, passing through the block and exit the block through the front face,

barrel means having a tip and opposed rear end which is removably attached to the front face by the rear end, said welding wire being fed by the drive means through the barrel to exit at said tip,

valve means mounted within the block in communication with the passageway for controlling the flow of gas through the passageway, said valve means including a valve actuator which opens the valve to allow gas to flow through the passageway and out said tip,

motor means removably mounted to the block near the central section and connected to drive means to provide the means for turning the drive means, said motor means being generally elongated to provide a handle for the gun, and including

a variable speed control mechanism so that the wire may be moved through the gun at different speed rates, said control mechanism including,

variable speed control means for the motor means which is mounted at the free end of the motor opposite the end of the motor mounted to the block,

said speed variable control means including a potentiometer having slider means which moves through at least a 1000 degrees of rotaiton, and

tactile response means which enables a user of the gun to experience through the sense of touch a high degree of control with minimum sensitivity in the control adjustment,

switch means mounted to the block which controls the operation of the motor means, said switch means being near the valve actuator,

a removable insulating casing member which encloses the block and motor, and

trigger means adjacent the motor including a trigger element which when the trigger is depressed first engages the valve actuator to open said valve and next engages the switch means to turn on the motor means.

4,954,691

METHOD AND DEVICE FOR CONTROLLING A SHORT CIRCUITING TYPE WELDING SYSTEM

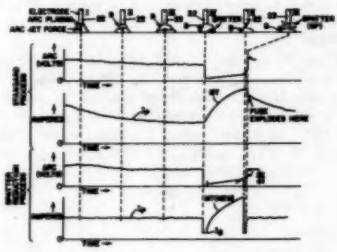
John M. Parks, Solon, and Elliott K. Stava, Brecksville, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Division of Ser. No. 940,880, Dec. 11, 1986, Pat. No. 4,717,807. This application Apr. 24, 1989, Ser. No. 343,238

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[5] B23K *9/10*

U.S. Cl. 219—137 PS **4 Claims**



1. A device for reducing spatter when a welding power supply is employed for depositing metal from a welding wire onto a workpiece by the short circuiting transfer mode wherein a welding current causes the welding wire to alternate between a short circuit condition and an arc condition, with metal transfer during a short circuit condition requiring a transfer time T_P during which transfer time the welding current rises and then falls as a melted portion of said wire is transferred to said workpiece, said device comprising:

(a) means for sensing the short circuit condition;

(b) switching means having a first switched conductive condition wherein said welding current is allowed to reach the normal unimpeded current level controlled by said power supply and a second switched non-conductive condition wherein said welding current is forced to flow through a low resistance resistor to limit the welding current to a low level background current, said switching means having low stored energy when shifted into either of said conditions;

(c) shift means responsive to said sensing means for shifting said switch means into said second switched condition before said short circuit condition;

(d) means responsive to said shift means for holding said switch means in said second, low current condition for a cycle T_1 beginning with said short circuit condition, wherein cycle T_1 has a duration with a maximum time less than said transfer time T_P; and,

(e) means operable during said short circuit condition for shifting said switch means to said first condition for the remainder of said short circuit condition whereby said welding current is allowed to reach the normal impeded current level in an unrestricted manner unless said arc condition is established during said short circuit condition.

4,954,692

POSITIVE TEMPERATURE COEFFICIENT THERMISTOR DEVICE FOR A HEATING APPARATUS

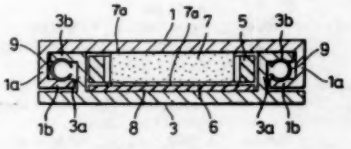
Takashi Shikama; Asami Wakabayashi, both of Yokaichi, and Kiyofumi Torii, Ohmihachiman, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 9, 1988, Ser. No. 242,966

Claims priority, application Japan, Sep. 11, 1987, 62-229161

Int. Cl.[5] H05B *3/04*

U.S. Cl. 219—365 **9 Claims**



1. A positive temperature coefficient thermistor device for use in a heating apparatus, which device comprises a board-type positive temperature coefficient thermistor element and a first and a second multi-finned radiator for radiation disposed adjacent a front and a rear surface of said thermistor element, respectively;

each of said first and second radiators having a pair of fitting flanges which are respectively arranged on a pair of opposed sides of said each radiator and which have longitudinal ends oriented to meet transverse to the flow direction of air to be heated by said positive temperature coefficient thermistor device;

corresponding fitting flanges of said first and second radiators being engaged with each other by means of respective resilient urging means which are inserted between respective pairs of opposing surfaces of the facing flanges to hold said facing flanges in fixed relation to each other; and

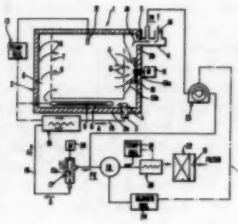
said thermistor element being contained in a space surrounded by said first and second radiators.

4,954,693

VENTILATION REGULATED HOT AIR SUPPLIED CONSTANT TEMPERATURE OVEN

Kenkachi Mitsuhashi, Kanagawa, and Shigeru Suga, Tokyo, both of Japan, assignors to Suga Test Instruments Co., Ltd. and The Yokohama Rubber Co., Ltd., both of Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 378,293
Int. Cl.[5] F24H *3/04*
U.S. Cl. 219—400 4 Claims



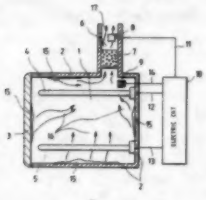
1. A ventilation regulated hot air supplied constant temperature oven wherein heated air of a predetermined temperature is supplied to a test oven body provided with an air supply port and an air discharge port with the ventilation of said test oven carried out at a predetermined rate at predetermined time intervals, comprising an oven body having an air supply port and an air discharge port to which a discharge cylinder is joined, a blower connected to said air supply port via an air supply passage, a differential pressure detector connected to said discharge cylinder and adapted to detect a differential pressure corresponding to the air flow rate on the basis of the data obtained in advance on the relation between a difference between the pressure at an outlet port of said blower and that at said discharge cylinder and the air flow rate, and a blower's revolutions regulator provided between said blower and said differential pressure detector and adapted to control the number of revolutions per minute of said blower in accordance with an output level of a signal corresponding to a differential pressure measured with said differential pressure detector.

4,954,694

COOKING OVEN HAVING FUNCTION TO AUTOMATICALLY CLEAN SOILS ATTACHED TO INNER WALLS THEREOF

Takeshi Nagai; Hiroshi Fukuda; Masahiko Itoh, all of Nara, and Takao Shitaya, Yamato Kouriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 30, 1989, Ser. No. 303,882
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—413 9 Claims



8. A self-cleaning type cooking oven having a function to pyrolytically eliminate food soils accumulated therein, said cooking oven comprising:

a cooking chamber;

heating means for supplying heat into said cooking chamber so as to allow pyrolytic degradation of the food soils accumulated on walls of said cooking chamber;

an exhausting passage coupled to said cooking chamber to exhaust gases generated due to the pyrolytic degradation in said cooking chamber to an ambient atmosphere;

an oxidizing catalyst provided in said exhausting passage to oxidize said gases passing therethrough;

gas sensor means provided in said exhausting passage to detect a gas component therearound and arranged to generate a gas signal indicative of the amount of said gas component;

temperature sensor means provided in said cooking chamber so as to generate a temperature signal indicative of a temperature of said cooking chamber; and

heat control means electrically connected to said heating means for controlling supply of heat into said cooking chamber, said heat control means being responsive to said gas signal from said gas sensor means and said temperature signal from said temperature sensor means so as to maintain a temperature of said cooking chamber up to a predetermined cleaning temperature and to determine a heating time period on the basis of the amount of said gas component indicated by said gas signal so that said cooking chamber is heated for said heating time period whereby the food soils accumulated on said walls of said cooking chamber is substantially degraded during said heating time period, said heat control means including:

first means responsive to said gas signal at a predetermined time, interval so as to generate a signal indicative of variation of the amount of said gas component;

second means for detecting a changing point from increasing to decreasing or vice versa in the variation of the amount of said gas component on the basis of said variation signals from said first means; and

third means for detecting a second changing point from decreasing to increasing or vice versa in the variation of said gas component after the detection of said first-mentioned changing point,

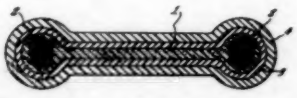
wherein said heat control means determines said heating time period on the basis of said second changing point detected by said third means.

4,954,695

SELF-LIMITING CONDUCTIVE EXTRUDATES AND METHODS THEREFOR

Robert Smith-Johannsen, and Jack M. Walker, both of Portola Valley, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 475,885, Mar. 16, 1983, abandoned, which is a continuation of Ser. No. 175,356, Aug. 4, 1980, abandoned, which is a division of Ser. No. 868,517, Jan. 11, 1978, Pat. No. 4,286,376, which is a continuation of Ser. No. 542,592, Jan. 20, 1975, abandoned, which is a continuation of Ser. No. 287,444, Sep. 8, 1972, Pat. No. 3,861,029. This application May 12, 1988, Ser. No. 195,558
Int. Cl.[5] H05B *3/10*
U.S. Cl. 219—548 18 Claims



1. An elongate self-regulating heater which comprises

(1) a melt-extruded element composed of a conductive polymer composition which comprises conductive carbon black dispersed in a crystalline polymeric material, said crystalline polymeric material consisting essentially of

(a) a mixture of polyethylene and a copolymer of ethylene

and a vinyl ester, the mixture containing at least 50% by weight of the polyethylene;

(b) a mixture of polyethylene and a copolymer of ethylene and ethylacrylate, the mixture containing at least 50% by weight of the polyethylene; or

(c) one or more of polyethylene, polypropylene, poly(-dodecamethylene pyromellitimide), ethylene-propylene copolymers, terpolymers of ethylene, propylene and one or more non-conjugated dienes, polyvinylidene fluoride, and copolymers of vinylidene fluoride and tetra fluoroethylene; and

(2) a pair of elongate parallel electrodes which are disposed in spaced-apart relation along and embedded in said element and are jointed by a web of said composition, and which can be connected to a source of electrical power to cause current to pass through the element, the percentage by weight(L) of conductive carbon black in said composition, based on the total weight thereof, being not greater than about 15, and the room temperature resistivity (R) in ohm-cm of said conductive polymer being such that

$$2L+5\log_{10}R \leq 45.$$

4,954,696

SELF-REGULATING HEATING ARTICLE HAVING ELECTRODES DIRECTLY CONNECTED TO A PTC LAYER

Kazunori Ishii; Seishi Terakado, both of Nara; Yasutomo Funakoshi, and Tadashi Sakairi, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

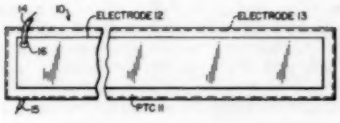
Continuation of Ser. No. 809,966, Dec. 17, 1985, Pat. No. 4,783,587. This application May 5, 1988, Ser. No. 190,562

Claims priority, application Japan, Dec. 18, 1984, 59-266640; Dec. 18, 1984, 59-266641; Dec. 18, 1984, 59-266647; Dec. 18, 1984, 59-266649; Dec. 18, 1984, 59-266664; Dec. 18, 1984, 59-266665; Dec. 18, 1984, 59-266666; Dec. 18, 1984, 59-266668; Dec. 18, 1984, 59-266669; Oct. 18, 1985, 60-233618

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[5] H05B *3/10*

U.S. Cl. 219—548 **70 Claims**



1. A self-regulating heating article comprising:

a first conductive elongate layer comprising a crystalline polymeric composition of high crystallinity and conductive particles dispersed in said polymeric composition to exhibit a positive temperature coefficient of resistance, the first layer having a thickness of 1 millimeter or less; and

a pair of second conductive elongate layers adapted for connection to a power supply, said second layers being metallic and secured one on each surface of said first layer to develop a potential in the direction of thickness of the first layer and to effect an effective exothermic portion at said first layer where said pair of second layers overlaps, said second layers having a creeping distance therebetween along peripheral edges, said creeping distance being greater than the thickness of said first layer.

4,954,697

VENDING APPARATUS FOR SELF-SERVICE STORE

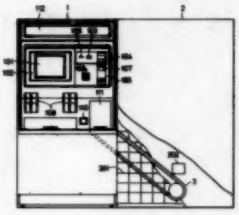
Yoshikazu Kokubun; Akihito Kurosawa; Kohei Ushikubo, and Shinji Todokoro, all of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 915,647, Oct. 6, 1986, abandoned. This application Apr. 6, 1989, Ser. No. 333,804

Claims priority, application Japan, Oct. 5, 1985, 60-222317

Int. Cl.[5] G06F *7/08*

U.S. Cl. 235—381 **3 Claims**



1. A vending apparatus, comprising:

cabinet means provided with storage means for storing a plurality of different items available for purchase;

memory means for storing product data associated with said plurality of different stored items, said product data including multiple displays of more precise product information on successive screen displays;

information transmission means for visually and audibly reproducing selected corresponding segments of the product data including image display means for displaying visual video information on said plurality of different stored products available for purchase, and speaker means for reproducing audio information corresponding to said plurality of different stored products available for purchase, said image display means including an image display unit having a display panel;

input means for receiving selection and designation data from user in accordance with the data in said information transmission means, said input means including a touch sensing input device on said display panel;

deposit means for receiving payment for items selected for purchase; and

dispensing means responsive to the payment means and the input means for ejecting items selected by the user for receipt by the user.

4,954,698

SENSOR ALIGNING MEANS FOR OPTICAL READING APPARATUS

Yoshitaka Yasunaga, and Toru Nakamura, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 818,207, Jan. 13, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 240,453

Claims priority, application Japan, Jan. 14, 1985, 60-3248[U]

Int. Cl.[5] G06K *7/10, 13/063*

U.S. Cl. 235—454 **4 Claims**

1. An apparatus for optically reading characters from any of a plurality of record media having lines of characters at different heights, comprising:

a housing;

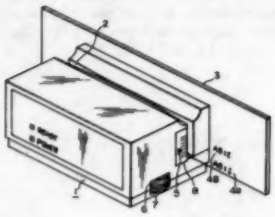
means in said housing for defining a gap through which a record medium may be passed;

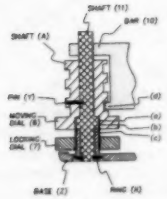
optical reader means in said housing near said gap reading characters from the record medium passing through said gap;

means for adjusting a height of said optical reader means

including an adjustment dial on an outer surface of said housing; and

means, visible from outside said housing, for indicating the height of said optical reader means, said indicating means





being positioned adjacent said gap so that the indicated height of said optical reader means can readily and directly be compared to a line of characters on a portion of the record medium which extends out of said gap.

4,954,699

SELF-ADMINISTERED SURVEY QUESTIONNAIRE AND METHOD

Steve Coffey, and William Weber, both of Glen Cove, N.Y., assignors to NPD Research, Inc., Port Washington, N.Y.

Filed Apr. 13, 1988, Ser. No. 181,403
Int. Cl.[5] G06K 7/10
U.S. Cl. 235—462 **15 Claims**

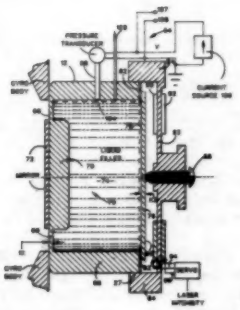
1. In a survey questionnaire comprising a plurality of survey questions, and a plurality of selectable responses associated with each of said survey questions; the improvement comprising a bar code scannable pattern associated with each response, said bar code scannable pattern comprising a selectable response to a particular survey question and a skip pattern prompt indication embedded therein comprising prompting information corresponding to a next question to be answered in said plurality of survey questions in said survey questionnaire based on selection of said selectable response, said bar code scannable pattern being adapted for scanning by a bar code scanning device having a storage means and a display associated therewith for storing the scanned selectable response and displaying said prompting information, whereby a self-administered survey questionnaire may be provided.

4,954,700

PATHLENGTH CONTROL SYSTEM WITH DEFORMABLE MIRROR HAVING LIQUID-FILLED HOUSING

Ludd A. Trozpek, Claremont, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 24, 1989, Ser. No. 383,674
Int. Cl.[5] G01J 1/20
U.S. Cl. 250—201.9 **6 Claims**



1. A pathlength control system responsive to a pathlength control signal for adjusting a pathlength of a light beam in an optical signal process dependent on coherent light, the pathlength control system comprising:

a housing containing a liquid filled chamber, said liquid filled chamber having an extendable wall having an inner surface subject to the pressure of the liquid and an external surface perpendicular to a central axis, the external surface having a mirrored surface for insertion into and control of the light path, the central axis being coaxial with the light path, the liquid filled chamber also having a deformable wall having an inner surface subject to the pressure of the liquid and an external surface;

a displacement transducer, the displacement transducer being coupled to the deformable wall and responsive to a control signal of a first polarity for deflecting the internal surface of the deformable wall in a first direction to increase the pressure of fluid in the chamber to extend the extendable surface in a first direction.

the displacement transducer being responsive to a control signal of a second polarity for deflecting said internal surface of the deformable wall in a second direction to decrease the pressure of fluid in the chamber to extend the extendable surface in a second direction,

a control means for sampling coherent light from said light path and for providing said control signal to the displacement transducer to optimize the intensity of the beam; and

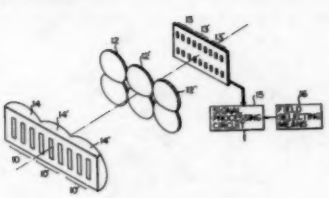
a transducer means responsive to fluid pressure within the liquid filled chamber for providing a chamber pressure signal.

4,954,701

FOCUS DETECTING APPARATUS PROVIDED WITH A PLURALITY OF DETECTING FIELDS

Kenji Suzuki; Keiji Ohtaka, and Yasuo Suda, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 281,781
Claims priority, application Japan, Dec. 14, 1987, 62-315490
Int. Cl.[5] G01J *1/20*; G03B *3/00*
U.S. Cl. 250—201.8 6 Claims



1. An apparatus for detecting a focus-adjusted state of an objective lens, comprising a plurality of juxtaposed units, each unit having:

a lens assembly for receiving light fluxes passed through different areas of a pupil of the objective lens and forming light intensity distributions whose relative position varies in conformity with the focus-adjusted state of the objective lens; and

a plurality of photoelectric sensor arrays disposed in a direction orthogonal to a direction in which said areas are arranged, for receiving the light intensity distributions and forming a signal indicative of the focus-adjusted state of the objective lens on the basis of the relative position of the light intensity distributions,

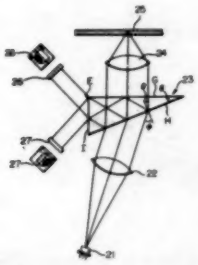
said juxtaposed units being disposed in the same optical path.

4,954,702

PROCESS FOR DETECTING A FOCAL POINT IN AN OPTICAL HEAD

Tatsuji Kurogama; Masanori Kawai, both of Hachioji; Koji Matsushima, Akishima, and Mitsuru Watanabe, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 13, 1988, Ser. No. 257,367
Claims priority, application Japan, Oct. 14, 1987, 62-259233; Nov. 30, 1987, 62-304110; May 31, 1988, 63-134690
Int. Cl.[5] G01J *1/20*
U.S. Cl. 250—201.2 34 Claims



1. A method for detecting a focal point by the use of an optical system comprising,

(a) a light source for emitting a luminous flux to irradiate a recording medium;

(b) a prism including a first surface into which said luminous flux emanating from said recording medium enters, said first surface being substantially perpendicular to said luminous flux emanating from said recording medium, a second surface which is inclined relative to said first surface for reflecting luminous flux traversing said first surface, and a third surface, joining said first surface and said second surface, through which said luminous flux passes;

(c) an objective lens provided between said prism and said recording medium;

(d) a photodetector for detecting the intensity of the light flux emanating from said recording medium, through said objective lens, and through said third surface of said prism, and converting the intensity of the light flux to an electric signal; and

(e) lens driving means attached to said objective lens and capable of moving said objective lens in a direction perpendicular to the surface of said recording medium in response to said electric signal;

said method comprising the steps of:

placing said prism so that the incident angle of said luminous flux emanating from said recording medium through said objective lens is smaller than the emergent angle of said flux from said prism to said photodetector;

detecting said intensity of the light flux emerged from said third surface of said prism by said photodetector to convert into an electric signal; and

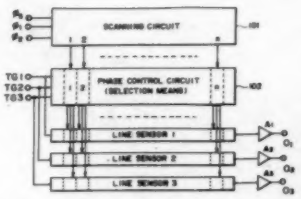
operating said lens driving means to adjust the distance between said recording medium and said objective lens in response to said electrical signal.

4,954,703

COLOR LINE SENSOR APPARATUS

Hayao Ohzu, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,607
Claims priority, application Japan, Dec. 21, 1987, 62-321422
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.1 18 Claims



1. A color line sensor apparatus comprising:

(a) a plurality of color line sensors;

(b) selection means for selecting one of said plurality of color line sensors; and

(c) one scanning means, capable of scanning each of the plurality of color line sensors, for scanning the color line sensor selected by said selecting means by providing a scanning signal.

4,954,704

METHOD TO INCREASE THE SPEED OF A SCANNING PROBE MICROSCOPE

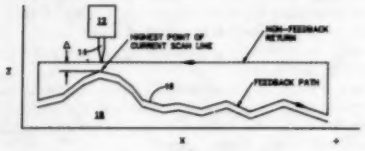
Virgil B. Elings, Santa Barbara, and Peter Maivald, Goleta, both of Calif., assignors to Digital Instruments, Inc., Santa Barbara, Calif.

Filed Dec. 4, 1989, Ser. No. 445,280
Int. Cl.[5] H01J *37/26*
U.S. Cl. 250—307 28 Claims

1. In a scanning probe microscope having a probe moved in perpendicular X and y directions over the surface of a sample to create a raster scan thereof and controlled and sensed in a Z direction vertical to the surface to gather data about the topography of the surface, the method of operation for increasing

the speed of gathering data about the surface being scanned comprising the steps of:

(a) traversing the surface from a first edge of a scanning area with the probe in a +X direction at a first rate of speed while feedback controlling and sensing the Z direction;



(b) lifting the probe above the surface a clearance distance at a second edge of the scanning area opposite the first edge in the +X direction; and,

(c) returning the probe to the first edge in a −X direction without feedback control thereof at a second rate of speed which is faster than the first rate of speed.

4,954,705

METHOD FOR EXAMINING A SPECIMEN IN A PARTICLE BEAM INSTRUMENT

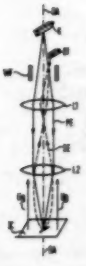
Matthias Brunner, Kirchheim, and Burkhard Lischke, Muenchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 2, 1989, Ser. No. 416,996

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902165

Int. Cl.[5] H01J *37/28*

U.S. Cl. 250—310 **13 Claims**



1. A method for examining a specimen in a particle beam instrument in which the specimen is irradiated by a particle probe, comprising the steps of:

generating a line-shaped cross section particle probe;

directing the particle probe onto the specimen to cause the generation of a line-shaped secondary particle source; and

imaging the secondary particle source onto a detector of the particle beam instrument.

4,954,706

RADIOGRAPHIC IMAGE PICKUP APPARATUS

Tetsuhiko Takahashi, Tokyo; Kenichi Okajima, Hoya, and Hiroshi Takeuchi, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 181,694, Apr. 14, 1988. This application Mar. 30, 1989, Ser. No. 330,495

Claims priority, application Japan, Apr. 1, 1988, 63-78009

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—327.2 **6 Claims**

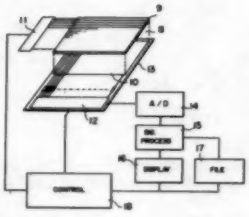
1. A radiographic image pickup apparatus comprising:

a phosphor layer for converting a radiographic image into an optical image;

at least one photoconductive layer optically coupled with said phosphor layer;

a first and a second electrode sandwiching said photoconductive layer, at least one of the first and the second electrodes being divided into one-dimensional array-formed elements aligned in a first direction;

a substrate on which at least said photoconductive layer and said first and second electrodes are integrated in one body;



exciting light-emitting means optically coupled with said photoconductive layer, said exciting light-emitting means being divided into one-dimensional array-formed elements aligned in a second direction orthogonal to said first direction;

selection means for selectively connecting respective elements of one of said one-dimensional array-formed elements to one signal line, wherein said selection means is formed on said substrate in a region which is not exposed to said radiographic image.

4,954,707

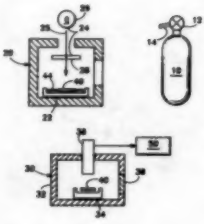
SYSTEM FOR USE WITH SOLID STATE DOSIMETER

Steven D. Miller, Richland; Joseph C. McDonald, Pasco; Fred N. Eichner, Kennewick, and Paul L. Tomerlassen, Richland, all of Wash., assignors to Battelle Memorial Institute, Ohio

Filed Jun. 29, 1988, Ser. No. 213,245

Int. Cl.[5] G01T *1/115*

U.S. Cl. 250—337 **15 Claims**



1. A method for measuring the dosage of ionizing radiation to which a thermoluminescent material has been exposed, comprising the steps of:

(a) cooling said thermoluminescent material down to a temperature substantially below 200° K.;

(b) exposing said thermoluminescent material to light radiation in order to photoconvert high temperature traps into low temperature traps; and

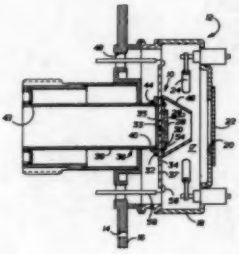
(c) detecting the light released by said thermoluminescent material as it is allowed to warm.

4,954,708

LOW DISTORTION FOCAL PLANE PLATFORM

Donald E. Salzer, Santa Barbara, and Nevil Q. Maassen, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 23, 1989, Ser. No. 397,808
Int. Cl.[5] G01J 5/06
U.S. Cl. 250—352 20 Claims



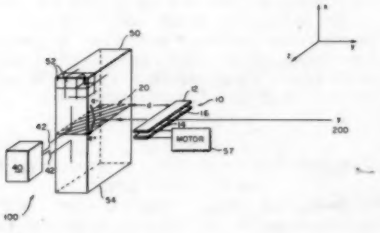
1. A detector assembly comprising:
a dewar housing providing an evacuated cavity;
a focal plane platform within said evacuated cavity, said focal plane platform having a tungsten end-cap and a ceramic mounting board;
a detector mounted on said ceramic mounting board;
means for cooling said focal plane platform and said detector; and
whereby said focal plane platform inhibits thermal distortion during cooling of said detector while providing thermal conductivity between said cooling means and said detector.

4,954,709

HIGH RESOLUTION DIRECTIONAL GAMMA RAY DETECTOR

Arie Zigler; Yosset Eisen, and Yossef Eisen, all of Rishon Le Zion, Israel, assignors to Apti, Inc., Washington, D.C.

Filed Aug. 16, 1989, Ser. No. 394,331
Int. Cl.[5] G01T 1/29, 7/00
U.S. Cl. 250—385.1 14 Claims



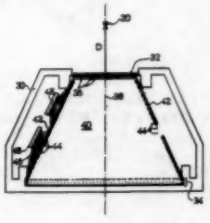
1. A directional gamma ray detector, comprising:
a first multicell gas chamber and a second multicell gas chamber, each multicell gas chamber having a plurality of gas cells that generate a signal indicative of an electron or positron passing through the gas cell;
a reaction foil located between and separating the first and second multicell gas chambers, wherein the foil reacts with gamma rays incident to an edge of the foil to produce electron/positron pairs;
a shield located adjacent to at least one edge of the foil and having a thickness sufficient to prevent gamma rays originating from a direction other than the direction of interest from reacting with the foil within a predetermined acceptable value;
a collimator having a collimator opening which permits passage of gamma rays originating from a direction of interest; and
an electronic computation system coupled to the first and second multicell gas chambers to receive the signals generated from the gas cells.

4,954,710

PARALLAX-FREE GAS DETECTOR FOR X-RAYS

Vincent Comparat, Grenoble; Jean Ballon, Moirans; Pierre Carrechio, Saint Martin le Vinoux, and Alain Pelissier, Fontaine, all of France, assignors to Centre National de la Recherche Scientifique, Paris and Societe Inel, Les Ulis, both of, France

Filed Apr. 27, 1989, Ser. No. 343,627
Claims priority, application France, Apr. 27, 1988, 88 06018
Int. Cl.[5] H01J 47/02
U.S. Cl. 250—385.1 10 Claims



1. A gas detector for radiations emitted by a sample (20), comprising a closed chamber (30) containing a gas absorbing the radiation, an input window (32) transparent to the radiations to be detected, an absorption and drift space (40) behind the input window and, at the extremity of this space, a plane two-dimensional detector for the localization of electrons (34) for determining the coordinates of an arrival point of electrons generated by a photon impact in the absorbing gas, the detector further comprising a set of input electrodes (36) placed behind the input window and highly radiation-transparent, further comprising a set of lateral electrodes (44) surrounding the absorption and drift space, the individual input electrodes (36) and the individual lateral electrodes (44) being set to voltages different the ones from the others and variable as a function of the position where it is desirable to place the sample with respect to the input window, the voltages determined for each of the electrodes being such that the absorption and drift space is shared into two parts without using electrodes physically delimiting this separation, the equipotentials in the first part being spheric or quasi-spheric and centered on the position of the sample, and the equipotentials in the second part being continuously variable from a spheric shape, at the place of the separation, to a plane shape at close proximity of the plane electron detector.

4,954,711

LOW-VOLTAGE SOURCE FOR NARROW ELECTRON/ION BEAMS

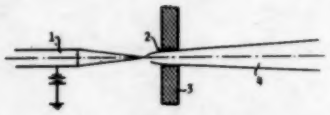
Hans-Werner Fink, Gattikon, Switzerland; Roger Morin, Marseilles, France; Heinz Schmid, Oberrieden, Switzerland, and Werner Stocker, Wadenswil, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1989, Ser. No. 427,651

Claims priority, application European Pat. Off., Nov. 1, 1988, 88810742

Int. Cl.[5] H01J 37/073, 37/08

U.S. Cl. 250—423 R 8 Claims



1. Low-voltage source for electron/ion beams, comprising a pointed tip (1, 15) connected to a source of electrical potential, characterized in that said tip (1, 15) is aligned with an aperture (2, 14) in a thin sheet (3, 13), the distance between said tip (1, 15) and said aperture (2, 14) being between 1 and 10 nanometers, the diameter of said aperture (2, 14) being less than 1 micrometer, and the potential at said tip (1, 15) being such that free electrons are spontaneously emitted from said tip (1, 15) and passed through said aperture (2, 14) to form a beam (4) of charged particles on the downstream side of said sheet (3, 13).

4,954,712

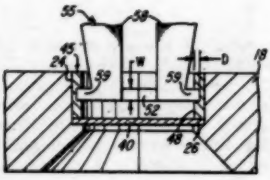
SPECIMEN RETAINING RING SYSTEM FOR AN ELECTRON MICROSCOPE

Harry P. Wilcox, 2761 Varisty Dr., Fairborn, Ohio 45324

Filed Oct. 16, 1989, Ser. No. 421,827

Int. Cl.[5] H01J 37/20

U.S. Cl. 250—440.1 15 Claims



1. In a specimen holder assembly for use in an electron microscope and including a specimen grid block defining a generally cylindrical bore extending from an inwardly projecting shoulder for supporting a circular specimen grid, an improved specimen grid retaining ring system comprising a generally cylindrical ring-like body extending into said bore and having an inner surface and an outer surface engaging said grid block, said body being split in an axial direction and being slightly flexible in a radial direction, means defining a recess within said inner surface, a hand tool having spaced relatively movable legs adapted to extend into said body, and said legs including outwardly projecting tip portions adapted to extend into said recess for releasably gripping said body with said tool to facilitate precision insertion and retraction of said body from said bore for removably retaining the specimen grid.

4,954,713

DEVICE FOR CHARACTERIZING SEMICONDUCTOR SAMPLES BY PHOTOLUMINESCENCE WITH HIGH SPATIAL RESOLUTION AND AT LOW TEMPERATURE

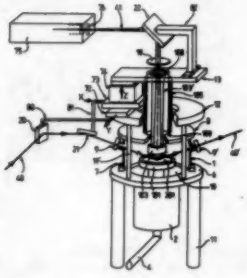
Jean Le Bris, Quincy-Sous-Senart; Marko Erman, Paris, and Gérard Gillardin, Villecresnes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1989, Ser. No. 377,361

Claims priority, application France, Jul. 8, 1988, 88 09296

Int. Cl.[5] G01N 21/64

U.S. Cl. 250—458.1 22 Claims



1. A device for characterizing wafers of semiconductor materials by photoluminescence with high spatial resolution and at low temperature, this device comprising at least:

(a) a cryostatic vacuum chamber provided with a cooled sample carrier adapted to receive the wafers and provided with at least one window for the transmission of the light beams implied in the photoluminescence process;

(b) optical means for forming a luminous spot on the wafer from a laser beam and for transmitting the re-emitted photoluminescence beam to a detector, characterized in that the optical means comprise first optical means for forming on the wafer from the laser beam a wide unfocused luminous spot and second optical means with high resolution for forming with a magnification exceeding unity on the receiving surface of the detector the photoluminescence image of the surface of the luminous spot, a device characterized in that said optical means comprise a catadioptric optical system comprising mirrors having a large numerical aperture arranged in the path of the photoluminescence beam and operating at the diffraction limit so that from a large central zone of the surface to the luminous spot considered as an object a quasi parallel image beam is formed at the wavelength of the photoluminescence with a large magnification and in that the detector is apt to supply a digitized image thereof.

4,954,714

APPARATUS FOR TIME-RESOLVED PHOTOGRAPHY OF FLUORESCENCE

Alfred Pollak, and Michael Maszkiewicz, both of Toronto, Canada, assignors to HSC Research Development Corporation, Toronto, Canada

Filed Sep. 26, 1988, Ser. No. 248,723

Int. Cl.[5] G03B 15/04, 42/08; G03C 5/04

U.S. Cl. 250—458.1 12 Claims

1. An apparatus for time-resolved photographic analysis of an excited sample capable of emitting fluorescent radiation, said apparatus comprising

means for emitting radiation pulses at a prescribed frequency for exciting a sample which may contain a label capable of fluorescing on a prolonged basis when excited compared to short-lief background fluorescence of a sample,

means for holding a sample to be analyzed,

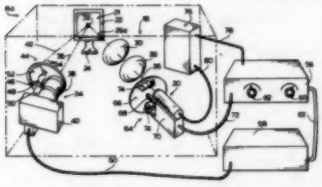
means for focusing radiation pulses emitted by said radiation emitting means along a first path towards a sample held by said holding means,

a camera focused along a second path on a sample held by said holding means where said second path diverges in relation to said first path, said camera being adapted to expose continuously a photographic film in said camera at least while said apparatus is in operation,

a rotating chopper element having at least one aperture located therein which repetitiously crosses said second path,

drive means for rotating said chopper element,

means for coordinating phase relationship of the rotation of



said chopper element relative to said prescribed frequency of radiation pulses from said emitting means, said coordinating means being adjustable to select a phase relationship which causes each of said apertures to cross said second path to expose photographic film of said camera to fluorescent radiation emitted by a fluorescing label present in a sample after short-life background fluorescence of sample components has subsided and before the next pulse of radiation from said emitting means occurs, said photographic film of said camera being repetitively exposed to fluorescent radiation to record thereby all photon energy from repetitive exposures on said photographic film of fluorescent radiation received from repetitive fluorescent emissions of a fluorescing label in a sample being analyzed.

4,954,715

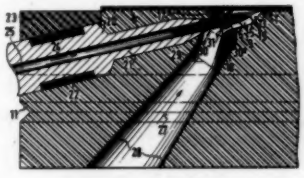
METHOD AND APPARATUS FOR AN OPTIMIZED MULTIPARAMETER FLOW-THROUGH PARTICLE AND CELL ANALYZER

Tibor Zöld, PhilippiStr. 13, 4400 Münster, Fed. Rep. of Germany

Continuation of Ser. No. 372,232, Jun. 26, 1989, abandoned, which is a continuation of Ser. No. 598,151, Apr. 9, 1984, abandoned. This application Jan. 29, 1990, Ser. No. 474,628

Int. Cl.[5] G01N *21/64, 21/05*

U.S. Cl. 250—461.1 **22 Claims**



1. A device for carrying out a method for generating a stream combination, composed of a very thin center stream of electrolyte with particles suspended in it and a hollow stream of usually transparent electrolyte, which envelops said very thin center stream, in a completely closed, streamlined flow chamber, which is free of air bubbles after a filling-up phase in which said chamber is filled-up by the two streams from which said fluid stream combination is composed, said device comprising:

a body;

a tube forming a nozzle within said body for leading a center-stream liquid coaxially into a chamber of said nozzle, said nozzle chamber having smooth, hydrophilic and streamlined curved inside walls so that said chamber is turbulence-free, a large part of the chamber being occupied by said nozzle; an entrance channel joined to said chamber so as to lead the liquid for the enveloping stream into said chamber with a small angle between the enveloping stream and the nozzle, so that the nozzle splits the entering enveloping stream into three partial streams including one partial stream flowing underneath the nozzle and two partial streams flowing around the nozzle, said entrance channel having a cross-sectional shape substantially the same as that of said chamber at a point where said chamber and said entrance channel are joined;

a surface combination included at the top of the nozzle, said surface combination having a concave-sided wedge-shape, and being tightly fitted against the nozzle so as to force said two partial streams flowing around the nozzle to reunite at a small angle and be parallel to the nozzle; and

the inside walls of said chamber being formed so as to reunite said three partial streams at a small angle with respect to each other and to wrap around the nozzle so as to form a hollow turbulence-free stream, so that said hollow stream sweeps bubbles out of the chamber and fills up a space between said nozzle and the walls of said chamber completely and in an air-bubble-free manner;

said nozzle having a tapered top so as to allow the reunited streams to form the hollow stream which envelopes the very thin center stream and focuses it hydrodynamically at a pointed part of the wedge-shaped surface combination as said stream combination leaves said chamber, so that a stable thin center-stream is reliably obtained.

4,954,716

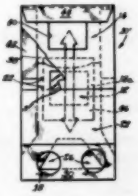
PACKAGE AND SUPPORT STRUCTURE FOR RADIATION DETECTOR

Robert V. Wheeler, Lemont, Ill., assignor to Tech/Ops Landauer, Inc., Glenwood, Ill.

Filed Jul. 13, 1988, Ser. No. 218,640

Int. Cl.[5] G03B *42/00*; G01T *1/04*

U.S. Cl. 250—482.1 **20 Claims**



1. A package for shielded handling of detector element and for selective exposure of said detector element to irradiation such as in radon detection, said package comprising:

(a) a support structure for securement of said detector within said package;

(b) a shielding structure for selective insulation of said detector member from said radiation in a shielding position of said support structure;

(c) an exposure structure for exposing said detector member to said irradiation or the like in an exposing position of said support structure, said exposure structure and said shielding structure being longitudinally separated for enabling said selective exposure; and

(d) transport means carrying said support structure and detector member for longitudinally displacing said sup-

port structure and detector member between said shielding and exposure structures in order to selectively displace said detector member between said shielding and exposing positions of said support structure.

4,954,717

PHOTOELECTRON MASK AND PHOTO CATHODE IMAGE PROJECTION METHOD USING THE SAME

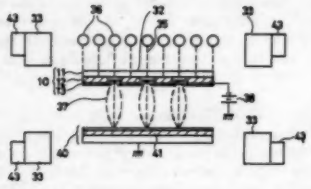
Kiichi Sakamoto, Tokyo; Hiroshi Yasuda, Yokohama; Akio Yamada, and Jinko Kudou, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1988, Ser. No. 283,982

Claims priority, application Japan, Dec. 15, 1987, 62-316901

Int. Cl.[5] H01J *40/06*

U.S. Cl. 250—492.3 15 Claims



1. A photoelectron mask for photo cathode image projection, comprising:

a transparent substrate;

a pattern formed on a main surface of said transparent substrate, said pattern including a non-transparent material; and

a photo cathode film formed covering the main surface of said transparent substrate on which said pattern is formed and having a thickness between 10 to 300Å, said photo cathode film including a material selected from the group consisting of pure platinum, a platinum-rich material containing platinum as the major component, and a platinum compound.

4,954,718

CIRCUIT ARRANGEMENT FOR DRIVING A PULSE-MODULATED INFRARED-RADIATION SOURCE

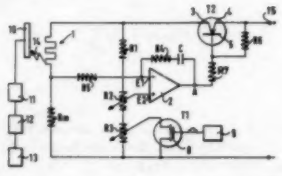
Hans Mattheissen, Gross Parin, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 5, 1989, Ser. No. 361,487

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819987

Int. Cl.[5] H01K *1/02*

U.S. Cl. 250—493.1 6 Claims



1. A circuit arrangement for providing a pulse-modulated power feed to an infrared radiation source which emits radiation detected by a receiver, the circuit arrangement comprising:

power supply means for supplying power for the radiation source;

control means for applying said power to said radiation source to directly control said radiation source alternately between an upper temperature desired value To for the duration of the pulse to cause said radiation source to radiate energy measuring signals to enable said receiver to detect measurement data and a lower temperature desired value Tu during the pulse off-time to cause said radiation source to radiate energy reference signals to enable sand receiver to detect reference data;

said control means having a desired value input; and,

pulse generating means connected to said control means at said desired value input for triggering the change between said two desired values (To, Tu).

4,954,719

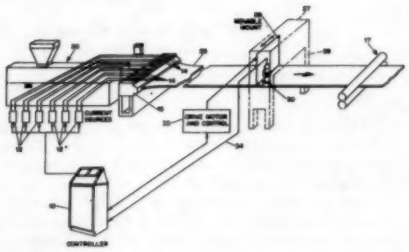
SHEET THICKNESS GAUGING METHOD AND SYSTEM WITH AUTO CALIBRATION

Holton E. Harris, Westport, Conn., assignor to Harrel, Inc., East Norwalk, Conn.

Filed Sep. 7, 1988, Ser. No. 241,486

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—560 13 Claims



1. In a method of gauging extruded sheet of the kind that includes the movement of a gauge transversely across the extruded sheet during regular thickness gauging of the sheet, the improved calibration for sheet width comprising the steps of:

(a) moving the gauge to a first position near a first edge of the sheet,

(b) moving the gauge more slowly towards the first edge,

(c) monitoring the sheet thickness with the gauge during the progress of the gauge towards the first edge,

(d) determining when apparent thickness measurement has dropped a predetermined substantial amount signifying the first edge of the sheet being located in the area of inspection of the gauge, and

(e) setting a limit to the regular thickness gauging movement of the gauge across the sheet at a location proximate the location where the gauge resides when the apparent thickness measurement has dropped the predetermined substantial amount that signifies the sheet edge.

4,954,720

METERING APPARATUS AND METHOD FOR THE MEASUREMENT OF A FIXED LENGTH OF CONTINUOUS STRAND

Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

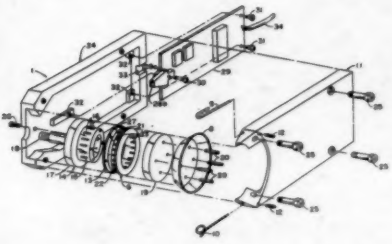
Filed Jan. 3, 1990, Ser. No. 460,491

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—561 30 Claims

1. In an apparatus for measuring a fixed length of strand as it is advanced from a supply source onto a rotating take-up reel by an appropriately powered winding mechanism operatively connected between said supply source and take-up reel so as to engage said strand and cause it to advance past an annular rotatable metering rim interposed between said supply source and take-up reel, the path of said advancing strand being partially wrapped about the circumference thereof, thereby causing said rim to rotate concentrically about a stationary hub

contained within a housing, said hub having means therein for the introduction and exit of a pressurized gas into the annular region formed between said hub and the inner wall of said rim thereby supporting the rim on a layer of pressurized gas about which said rim rotates at substantially the same tangential velocity as said advancing strand and with substantially zero



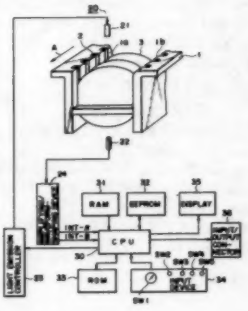
friction, the improvement comprising: a metering rim having a plurality of apertures through the surface thereof to allow said pressurized gas to partially escape from the annular region between said stationary hub and inner wall of said rim whereby any broken filaments of said strand are sloughed off from the surface of said rim.

4,954,721

APPARATUS FOR DETECTING AN ARRAY OF WAFERS

Fujio Suzuki, Shiroyama, Japan, assignor to Tel Sagami Limited, Kanagawa, Japan

Filed Mar. 29, 1989, Ser. No. 330,214
Claims priority, application Japan, Mar. 30, 1988, 63-76968
Int. Cl.[5] G01N *21/86*
U.S. Cl. 250—561 **11 Claims**



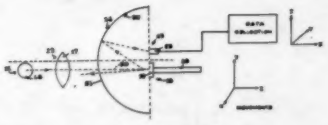
1. An apparatus for detecting an array of wafers, comprising:
reference information generating means for generating reference information from the reference condition in which wafers are arranged on a first wafer carrier;
window setting means for setting wafer-detecting windows at those positions where the wafers are to be arranged on a second wafer carrier, in accordance with the reference information supplied from said reference information generating means;
wafer detecting means for detecting the wafers arranged on the second wafer carrier and generating information representing the presence of the wafers on the second wafer carrier;
signal generating means for generating signals from the information generated by said wafer detecting means; and
wafer-position determining means for collating the signals supplied from said signal generating means with said wafer-detecting windows, thereby to detect the shape of that portion of any signal that corresponds to a wafer window, and to determine the position of the wafer from the shape of said portion of the signal.

4,954,722

SCANNING SCATTERING MICROSCOPE WITH HEMISPHERICAL MIRROR AND MICROFOCUSED BEAM

Joseph Fine, Silver Spring, and Denes Marton, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jul. 21, 1989, Ser. No. 382,884
Int. Cl.[5] H01J *3/14*; G01N *21/86, 21/47*
U.S. Cl. 250—571 **4 Claims**



1. A scanning scattering microscope apparatus for providing two dimensional micrographs of the overall surface microtopography of a specimen in response to the quantitative measurement of off-specularly reflected light wherein the apparatus comprises:
a light source unit comprising a conventional light source;
a focusing unit comprising a focusing lens for producing a micro focused beam of light from said light source;
a sample holding unit comprising a movable sample holding member wherein the sample holding member is designed to accommodate a specimen and is movable in the x, y, and z planes relative to the longitudinal axis of said focused beam of light which can scan the entire surface area of said specimen;
a light beam scanning unit which can scan the focused beam on a point by point basis in an X-Y direction over the specimen surface to obtain a high lateral resolution image of surface features;
a mirror unit comprising an apertured hemispherical mirror having an aperture hole formed therein at a location that is slightly offset relative to the center of the external periphery of the mirror; and,
a detector unit comprising a conventional photodetector member which is mounted at a point which is symmetrically located with respect to the focal point of the focusing lens wherein the center of symmetry is the center of the hemispherical mirror; and, wherein the signal output of the photodetector member provides data that can be used to produce a quantitative measurement of off-specularly reflected light from the specimen to plot a two-dimensional micrograph of the surface microtopography of the specimen.

4,954,723

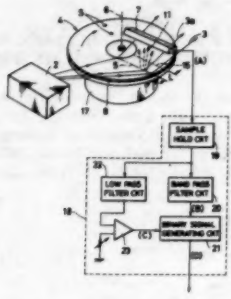
DISK SURFACE INSPECTION METHOD AND APPARATUS THEREFOR

Ippei Takahashi, and Takeshi Wakita, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1989, Ser. No. 372,632
Claims priority, application Japan, Jun. 13, 1988, 63-145356
Int. Cl.[5] G01N *21/89*
U.S. Cl. 250—572 **4 Claims**

1. A method of scanning a surface of a disk having signal recording pits or bumps covered with a transparent layer, with a flying spot to detect surface defects of the disk surface, said method comprising:
rotating said disk at a constant speed of rotation;
scanning said disk surface along a scanning line parallel to

but spaced from a line radial to the center of rotation of said disk; and



receiving diffused light reflected by said disk surface to provide output corresponding to the intensity of said diffused light.

4,954,724

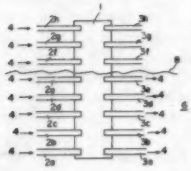
OPTICAL FUEL GAUGE FOR VEHICLES

Hideo H. Koda, 1880 Century Park East, Ste. 519, Los Angeles, Calif. 90067, and Bill Yoshida, 6242 Warner Ave., Apt. 23 E, Huntington Beach, Calif. 92647

Continuation of Ser. No. 178,144, Apr. 6, 1988, abandoned. This application Dec. 26, 1989, Ser. No. 456,945

Int. Cl.[5] G01N *15/06*

U.S. Cl. 250—577 **5 Claims**



1. A fuel gauge to be provided in a fuel tank for vehicles, comprising:

a light source;

a set of light emitting optical fibres, said fibres being arranged such that first light receiving ends thereof are disposed adjacent to said light source and second light emitting ends thereof are vertically distributed;

a set of light receiving optical fibres, said fibres being arranged such that a first light receiving end thereof is aligned along a straight line optical path with a corresponding second light emitting end of said light emitting optical fibre and second ends thereof are disposed to a display means; and

a solid optical medium provided in between and in said optical straight line path between said second ends of said light emitting optical fibres and said first ends of said light receiving optical fibres with a fluid space between said ends of said light emitting and light receiving optical fibers and said optical medium, said medium being positioned such that light emitted from said second end of said light emitting optical fibres reaches said first end of said light receiving optical fibres only if fuel is disposed on said fluid space between said ends and said optical medium.

4,954,725

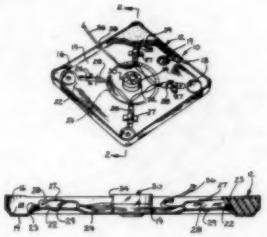
BI-PLANAR SWITCH DEVICE WITH LEVEL INDICATOR

Todd Webster, South Bend, Ind., assignor to Power Components of Midwest, Inc., Mishawaka, Ind.

Filed Mar. 20, 1989, Ser. No. 326,565

Int. Cl.[5] H01H *35/02, 35/14*

U.S. Cl. 307—10.1 **1 Claim**



1. A switch device adapted for connection to a vehicle, said switch device for indicating the orientation of said vehicle relative to horizontal and comprising a base, a plurality of switches, said base having a plurality of seating means for supporting said plurality of switches, each switch being seated in a said seating means and having an open position and a closed position dependent upon the orientation of the switch relative to the horizontal, each switch supported in said seating means at a predetermined angle relative to said base, said angle being indicative of an at rest position of said vehicle relative to the horizontal when the switch device is connected to said vehicle, each of said switches independently shift between its open and closed positions when said vehicle is positioned at an angle which exceeds the switches predetermined angle, wherein each seating means is an indentation formed in said base, each indentation being spaced from another indentation and includes an end shoulder constituting means for supportiong a portion of said switch whereby said predetermined angle of said switch is increased.

4,954,726

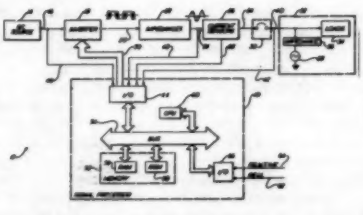
SWITCHING AN INVERTER WITH STORED SIGNAL SEQUENCES

Kenneth Lipman, and Douglas G. Young, both of West Hartford, Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Continuation of Ser. No. 890,664, Jul. 30, 1986, abandoned. This application Dec. 22, 1989, Ser. No. 456,043

Int. Cl.[5] H02J *3/18*

U.S. Cl. 307—46 **2 Claims**



1. A method for controlling the conduction states of the output stage switches of an inverter connected to a power grid for controlling the real and reactive power components of the single frequency output of the inverter to the grid according to the respective magnitudes of real and reactive power command signals, comprising the steps of:

storing a plurality of groups of sequences of transition initiating signals for initiating transitions in the conduction states of the inverter output stage switches, each sequence for effecting a selected number of inverter output current reversals, each group of stored sequences having the same number of transition initiating signals within each of its sequences which is different than the number of transition initiation signals in the sequences of each other group;

selecting in response to a reactive power command signal a stored sequence of transition initiating signals from one of said groups and providing a corresponding timed sequence of inverter output current reversals which in turn effects the commanded reactive power output component, said selected one of said groups being a group having a greater number of transition initiating signals in each of its sequences for a decreasingly leading and increasingly lagging reactive power command signal, said selected one of said groups being a group having a lesser number of transition signals in each of its sequences for an increasingly leading and decreasingly lagging reactive power command signal; and

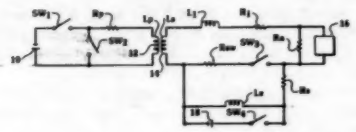
responding to leading and lagging real power command signals by respectively advancing and retarding the phase of the selected sequence to effect the commanded real power output component.

4,954,727

HYBRID TRANSFORMER CURRENT ZERO SWITCH

Mohamed A. Hilal, Madison, Wis., assignor to General Dynamics Corp., Space Systems Division, San Diego, Calif.

Filed Aug. 1, 1988, Ser. No. 227,974
Int. Cl.[5] H02B *1/24*
U.S. Cl. 307—112 **6 Claims**



1. A hybrid transformer current-zero switch, said transformer having a primary winding formed from a conductor means which has minimal resistance when in a superconducting first state and substantially uniform resistance along its length in a normal conducting second state, a load, a normal conducting secondary winding one end of which is connected directly to said load, means for establishing said primary winding in said first state, first power means for charging said primary winding while in said first state and means for changing said primary winding from said first state to said second state causing the charge in said primary winding to be transferred to said secondary wincing and said load comprising:

a series parallel circuit connected between the other end normal conducting secondary winding and said load said series parallel circuit comprising a switch in parallel with storage inductor; and

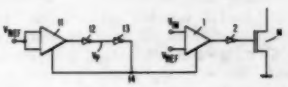
a second power supply for selectively charging said storage inductor, when said storage inductor is fully charged and said switch is closed just prior to said primary winding changing from said first to said second state high current flows through said switch and when said charge on said primary winding is transferred to said secondary winding current flows in said secondary winding causing said high current flow through said switch to approach zero whereby said switch can be opened without damage thereto thereby transferring the stored energy from said storage inductor into said load.

4,954,728

STABILIZED GENERATOR FOR SUPPLYING A THRESHOLD VOLTAGE TO A MOS TRANSISTOR

Antoine Pavlin, Aix En Provence, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Mar. 6, 1989, Ser. No. 318,870
Claims priority, application France, Mar. 9, 1988, 88/03751
Int. Cl.[5] H03K *3/01*; H03F *3/45*
U.S. Cl. 307—296.8 **12 Claims**



1. A stabilized bias generator for supplying a biasing voltage to a threshold voltage circuit wherein the threshold circuit supplies a threshold voltage to a MOS transistor of an integrated circuit, said threshold voltage circuit including a first comparator (1) having first and second inputs for respectively receiving an input voltage and a reference voltage, and an output connected to a first inverter (2) said biasing voltage being equal to the threshold voltage of the MOS transistor (M) when input voltages applied to said first and second inputs of said first comparator (1) are substantially equal, said stabilized bias generator comprising:

a second comparator (11) substantially equivalent to said first comparator (1) and having first and second inputs interconnected to receive a reference voltage;

a second inverter (12) substantially equivalent to said first inverter (2) and connected to receive an output from said second comparator; and

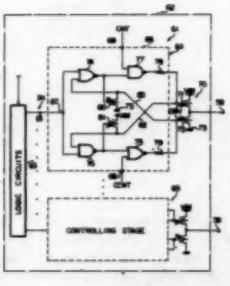
a third inverter (13) connected to receive an output from said second inverter (12) and an output (14) connected to supply said biasing voltage to said first and second comparators (1,11), said third inverter (13) having a threshold voltage substantially equal to the threshold voltage of the MOS transistor.

4,954,729

OUTPUT BUFFER CIRCUIT USED FOR STABLE VOLTAGE SOURCE

Takahiko Urai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 27, 1989, Ser. No. 371,865
Claims priority, application Japan, Jun. 27, 1988, 63-159655
Int. Cl.[5] H03K *17/16, 19/02, 5/12*
U.S. Cl. 307—443 **11 Claims**



1. An output buffer circuit for a bit of an input signal, comprising

(a) an output stage formed by a series combination of first

and second field effect transistors supplied with a pair of driving signals, respectively, for being complementarily shifted between on-states and off-states and coupled between first and second constant voltage sources respectively producing first and second voltage levels different in voltage level from each other, said driving signals taking high and low voltage levels in first and second states, respectively,

(b) an output node provided between said first and second field effect transistors, and

(c) a controlling stage supplied with the bit of said input signal and operative to change the levels of said driving signals from one of said high and low voltage levels to the other of the high and low voltage levels through a transition period between said first and second states, a time delay taking place between the driving signals, in which said controlling stage comprises, (c-1) driving signal producing means responsive to the bit of said input signal and operative to produce said driving signals, (c-2) load means coupled to said driving signal producing means and operative to cause said driving signals to gradually swing between said high and low voltage levels, and (c-3) speed controlling means coupled between gate electrodes of said first and second field effect transistors and said driving signal producing means and responsive to voltage levels at the gate electrodes of said first and second transistors for accelerating changes in said first and second driving signals in said transition period thereby to slowly vary said driving signals in an early stage of said transition period and to rapidly vary said driving signal in a later stage of said transition period, thereby preventing said driving signals from overlapping in said transition period.

4,954,730

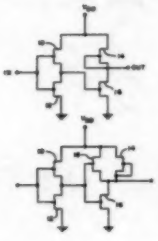
COMPLEMENTARY FET CIRCUIT HAVING MERGED ENHANCEMENT/DEPLETION FET OUTPUT

Kanji Yoh, Osaka, Japan, assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 21, 1989, Ser. No. 342,224

Int. Cl.[5] H03K *19/094, 17/12, 19/092, 17/687*

U.S. Cl. 307—451 **12 Claims**



1. An FET circuit comprising

a complementary FET circuit including at least one pair of serially connected complementary enhancement-mode transistors having a common terminal therebetween and with an output terminal at said common terminal, and

an output circuit including a first depletion-mode transistor serially connected with a first enhancement-mode transistor and having a common terminal therebetween, said first enhancement-mode transistor having a gate electrode connected to said output terminal of said complementary FET circuit, the first depletion-mode transistor having a gate electrode connected to said common terminal of said first serially connected depletion-mode transistor and said first enhancement-mode transistor, the output terminal of said output circuit being said common terminal.

4,954,731

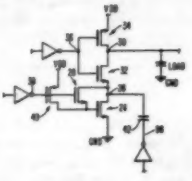
WORDLINE VOLTAGE BOOSTING CIRCUITS FOR COMPLEMENTARY MOSFET DYNAMIC MEMORIES

Sang H. Dhong, Mahopac; Wei Hwang, Armonk, and Nicky C. Lu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1989, Ser. No. 344,340

Int. Cl.[5] H03K *17/10*

U.S. Cl. 307—482 **11 Claims**



1. A voltage boosting clock circuit for semiconductor memory array wordlines comprising:

a boost capacitor element,

first, second, third, fourth and fifth transistor devices, said first and fifth transistor devices being of a first conductivity type and said second, third and fourth transistor devices being of a second conductivity type,

said first and second transistor devices having electrodes thereof connected together at a first node to a wordline of a memory array,

said third transistor device having an electrode thereof connected to an electrode of said second transistor device and an electrode thereof connected to said boost capacitor element,

said fourth transistor device having an electrode thereof connected to an electrode of said second transistor device,

said fifth transistor device having an electrode thereof connected to an electrode of said fourth transistor device,

a source of potential VDD and a source of ground potential GND,

said first and fifth transistor devices also having electrodes thereof connected to said potential source VDD, and said first transistor device having an electrode thereof connected to a source of timing signals at a second node,

wherein initially said timing signals at said second node are in a first level condition and said first transistor device is on and said second transistor device is off, wherein said wordline connected to said first node is at a potential VDD,

wherein, in response to said timing signals going to a second level condition, said first transistor device turns off, said second transistor device, turns on, the voltage level of VDD of said wordline connected to said first node discharges through at least said second transistor device and said wordline at said first node becomes connected to said boost capacitor through said second transistor device and the voltage level at said wordline therefore becomes more negative than said ground potential GND.

4,954,732
ADAPTIVE NONLINEAR FREQUENCY DOMAIN FILTER WITH LOW PHASE LOSS

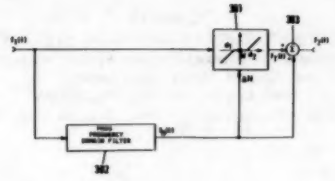
Michael Surauer, Chieming, and Helmut Bittner, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 225,276

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725107

Int. Cl.[5] H03K 5/00, 1/00

U.S. Cl. 307—520 25 Claims



1. A nonlinear frequency domain filter for the suppression of unwanted signals which are superposed on a wanted signal variable in a given frequency range, comprising a dead-zone member and a pass-band filter, the dead-zone member having a zero point, an input for receiving an input signal to be filtered and an output for providing an output signal, the pass-band filter having an input for receiving said input signal and also having an output for providing an output signal, said input signal comprising said wanted signal and said unwanted signals, and further comprising means for zero point adaptation of said dead-zone member such that the zero point follows proportionally said output signal of the pass-band filter, the output signal from the pass-band filter further being added to the output signal from the dead-zone member to provide an output signal of the filter.

4,954,733
COAXIAL STARTER

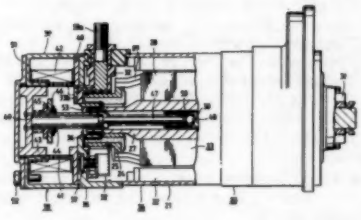
Shuzoo Isozumi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 324,506

Claims priority, application Japan, Mar. 17, 1988, 63-66019

Int. Cl.[5] H02K 11/00, 7/10; F02N 11/00

U.S. Cl. 310—71 2 Claims



1. A coaxial starter comprising:

an electric motor having an armature shaft which is hollow;

an output rotary shaft which is disposed at a front end of said motor and inserted in an internal opening of said armature shaft at one end of said output rotary shaft so as to be slidable in an axial direction of said output rotary shaft and has a pinion at another end thereof so that said pinion is engaged with or disengaged from a ring gear of an engine;

an electromagnetic switch disposed at a rear end of said motor so as to energize said motor and slide said output rotary shaft;

a housing nearly shaped as a cup and having a through hole in a rear portion of said housing provided between a yoke of said motor and said switch;

a bearing for supporting said armature shaft and provided in said housing;

a brush holder of said motor supported in such a manner that said holder is covered with said housing and projects out of a nearly central portion of said housing; and

fixed contact members attached to said holder integrally therewith and projecting out of said through hole in such a manner that said fixed contact members face a movable contact of said switch, wherein a disk-shaped hollow core, which constitutes a magnetism passage of the electromagnetic switch, is provided in contact with the rear end of the housing; and said fixed contact members project out of the through hole of said housing and a notch of said core in such a manner that said core is supported around said fixed contact members.

4,954,734
THREE PHASE ALTERNATOR WITH COMMON NEUTRAL LEADS

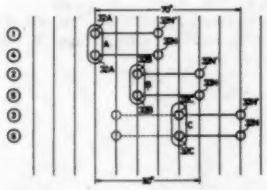
Kazuyoshi Iguchi; Tashima, Masatoshi; Ryoichi Tazi; Soichi Yoshino, and Motoo Yagi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,074

Claims priority, application Japan, May 26, 1987, 62-130223; May 27, 1987, 62-134293

Int. Cl.[5] H02K 15/04; H01R 13/415

U.S. Cl. 310—71 4 Claims



1. In a stator of a vehicle mounted alternator having a rotor and a rectifier, said stator including an armature core formed in an inner periphery thereof with a plurality of slots and three-phase armature coils wound in respective said slots of said armature core, coil lead terminals and a neutral lead terminal of said armature coils for each phase being arranged in a limited area so that connections thereof to said rectifier of said alternator are facilitated, an improvement comprising said neutral leads of said armature coils for three phases derived directly at a single position between said coil leads of said armature coils, respectively, to thereby minimize the length of said neutral leads of each phase to said single position and at least one metal binder for bundling and electrically connecting said neutral leads together at said point from which a neutral lead terminal to be connected to said rectifier is derived.

4,954,735
LINEAR ACTUATOR

Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, England

Filed May 14, 1989, Ser. No. 366,592

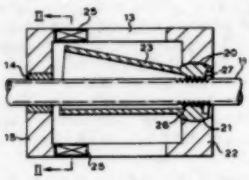
Claims priority, application United Kingdom, Jun. 16, 1988, 8814324

Int. Cl.[5] H02K 7/06

U.S. Cl. 310—82 6 Claims

1. A linear actuator comprising a screw threaded shaft

mounted so that it is restrained from rotational movement, a cage mounted in sliding relationship on the shaft, an internally threaded member mounted towards one end of the cage in a spherical bearing, the threadform of the internally threaded member being similar to that of the shaft but of larger diameter, the internally threaded member having a skirt formation coaxial with the internal thread, said skirt formation extending towards the other end of the cage, at least a circumferential



portion of the skirt formation remote from the internally threaded member being made of ferromagnetic material, and a series of angularly spaced coils being provided around the cage adjacent to the ferromagnetic portion of the skirt, said coils being arranged to be energised sequentially, so that they will attract the ferromagnetic portion of the skirt and cause the internally threaded member to skew so that the threads thereof engage the threads of the shaft.

4,954,736

PERMANENT MAGNET ROTOR WITH MAGNETS SECURED BY SYNTHETIC RESIN

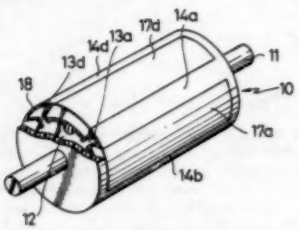
Tetsuo Kawamoto; Ryo Motohashi; Toshihiro Sakamoto; Yasuo Suzuki, and Hideaki Abe, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Apr. 20, 1989, Ser. No. 340,764

Claims priority, application Japan, Apr. 25, 1988, 63-101788; Jun. 27, 1988, 63-158461

Int. Cl.[5] H02K *21/12, 1/04, 1/22*

U.S. Cl. 316—156 **9 Claims**



1. A permanent magnet rotor comprising:

a rotor shaft;

a yoke which is coaxially secured to said rotor shaft, said yoke having a central portion and a plurality of magnet-holding projections which project radially outward from the central portion of said yoke and extend in the axial direction of said yoke, each magnet-holding projection having a radially inner end which is secured to the central portion of said yoke and a radially outer end which has a greater width than the radially inner end;

a plurality of permanent magnet segments which extend in the circumferential direction of said yoke between adjacent magnet-holding projections, each of said magnet segments having end portions cooperating with the radially outer ends of said magnet-holding projections in the circumferential direction of said yoke to prevent the segment from moving radially outward, each segment being separated from said yoke by a gap along at least a portion of its periphery, the end portions being separated from said magnet-holding projections by gaps;

thermosetting synthetic resin filling the gaps between said magnet segments and said yoke and between the end portions of said segments and said magnet-holding projection and maintains the positions of said permanent magnet segments constant with respect to said yoke; and

said yoke having a recess which is formed on the outer periphery of the central portion of said yoke in the gap between the central portion and said permanent magnet segments, which extends in the axial direction of said yoke, and which is filled with said synthetic resin.

4,954,737

PULSE GENERATOR FOR A ROTARY SPEED SENSOR

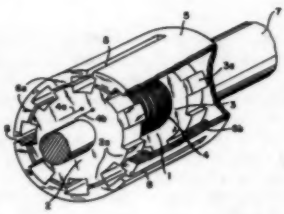
Jean Guichard, La Garenne Colombes, France, assignor to Messier-Hispano-Bugatti, Montrouge, France

Filed Jun. 21, 1989, Ser. No. 369,606

Claims priority, application France, Jun. 30, 1988, 88 08837

Int. Cl.[5] H02K *1/22;* **G01P** *3/48*

U.S. Cl. 310—168 **4 Claims**



1. A pulse generator having a magnetic circuit closed around a stationary part by a portion of the wall of a bell-shaped part rotating about its axis and coupled at one of its ends to a drive member, said wall portion and said stationary part together defining an air gap which varies depending on the relative angular positions of the wall portion and the stationary part, such that during rotation magnetic field variations are generated at a frequency proportional to the speed of rotation of the rotation part, the generator including an electrically conductive winding in which the field variations generate electrical pulses, wherein the wall includes at least one longitudinal slot.

4,954,738

CURRENT SOURCE TECHNOLOGY

Gene J. Gaudenzi, Purdys, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 197,779, May 23, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 497,758

Int. Cl.[5] H03K *19/013, 19/086, 5/12*

U.S. Cl. 307—454 **5 Claims**

1. A high speed, low power, current-controlled logic system comprising:

a first section including input logic means (T1) for receiving a logic input signal and providing an output current in response thereto,

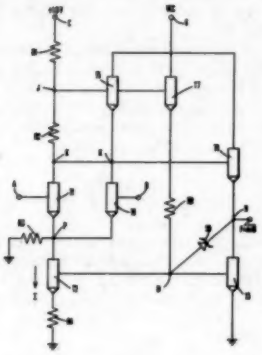
(a) an output section (T3) having an input (M), said output section (T3) providing an output signal (F) in response to a signal at said input (M) thereof,

(b) a switching device having a lower current circuit (T7 and RB) and a higher current circuit (T2)

(1) said higher current circuit (T2) including a higher current transistor (T2) carrying said output current from said input logic means (T1), and

(2) said lower current circuit (T7 and RB) providing a rapid change in potential across said lower current

circuit in response to a change in said higher current circuit, and



means for coupling said rapid change in potential from said low current circuit to the input (M) of said output section (T3).

4,954,739

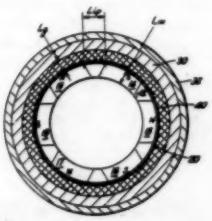
SERVO MOTOR WITH HIGH ENERGY PRODUCT MAGNETS

Roy D. Schultz, Dearborn, Mich.; Thomas R. England, and A. Clark Altizer, both of Radford, Va., assignors to Kollmorgen Corporation, Simsbury, Conn.

Continuation of Ser. No. 27,843, Mar. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 709,763, Mar. 8, 1985, Pat. No. 4,679,313. This application Nov. 3, 1988, Ser. No. 270,373

Int. Cl.[5] H02K *21/14*

U.S. Cl. 310—156 **18 Claims**



1. A dynamoelectric machine operating near the maximum energy point and having a high resistance to demagnetization and low roll-off to enable a high peak torque, comprising:

a permanent magnet rotor including a plurality of radially extending NdFeB permanent magnets providing pole faces separated by a non-magnetic medium, and each magnet having an energy product in excess of 30 MGOe;

a slotless cylindrical outer stator shell of magnetic material defining an air gap between said magnets and said stator shell;

an insulated wire winding secured to the inside surface of said stator shell; and

an encapsulating resin for impregnating said insulated wire winding to secure said winding to said slotless stator shell and, for withstanding the maximum torque force throughout the range of operating temperatures;

wherein said energy product and a ratio of the spacing between said pole faces to said air gap enable the machine to operate near the maximum energy point, have a high resistance to demagnetization and have low roll-offs for enabling a high peak torque.

4,954,740

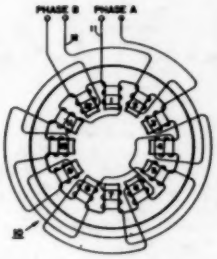
STATOR WINDING FOR TWO-SPEED ELECTRODYNAMIC MACHINES HAVING FRACTIONAL SPEED RATIOS

Robert N. Brigham, Monroe, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 27, 1987, Ser. No. 112,781

Int. Cl.[5] H02K *1/00*

U.S. Cl. 310—185 **3 Claims**



1. A stator for an A.C. motor, comprising: a plurality of legs, each leg having wound thereon an energizing coil, said coils being serially connected in one of two phases, in one of first and second conditions, to produce the polarities in the following table, where p= the number of stator pole pairs and n= all integers from 2 to p, inc'usive:

First Condition		
Leg No.	Phase	Polarity
1 + 4(p' − n)	A	+
2 + 4(p' − n)	B	+
3 + 4(p' − n)	A	−
4 + 4(p' − n)	B	−,

Second Condition		
Leg No.	Phase	Polarity
1 + 6(p − n)	A	+
2 + 6(p − n)	A	+
3 + 6(p − n)	B	+
4 + 6(p − n)	B	+
5 + 6(p − n)	A	−
6 + 6(p − n)	B	−,

where p' = 1.5 p;
where p ≧ 2.

4,954,741

CONTROL CIRCUIT FOR A VIBRATION WAVE MOTOR

Etsuro Furutsu, Kawasaki, and Kazuhiro Izukawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 346,281, May 1, 1989, abandoned, which is a continuation of Ser. No. 143,753, Jan. 14, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 420,619

Claims priority, application Japan, Jan. 19, 1987, 62-9442

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—316 **28 Claims**

1. A control circuit for a vibration wave motor comprising:

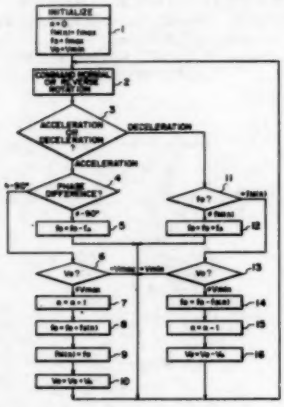
an electro-mechanical energy transducing element arranged on a vibration member;

application means for applying periodic signals to said en-

ergy transducing element, said vibration member generating a driving force comprising a travelling vibration wave upon application of the periodic signals to said energy transducing element;

a level adjuster for adjusting a level of the periodic signals;

a frequency adjuster for adjusting a frequency of the periodic signals; and



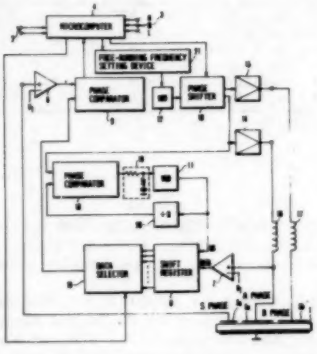
a switching circuit for switching the level of said level adjuster from a first level to a second level and for switching the frequency of said frequency adjuster from a first frequency to a second frequency when the frequency of said frequency adjuster has reached the first frequency during a period in which the level of said level adjuster is at the first level.

4,954,742

VIBRATORY-WAVE MOTOR DEVICE

Kazuhiro Izukawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1988, Ser. No. 292,538
Claims priority, application Japan, Jan. 11, 1988, 63-003425
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—316 **10 Claims**



1. A vibratory-wave motor device having a first mode in which a vibratory wave is formed by applying frequency signals of different phases to first and second electro-mechanical energy converting parts, respectively, which are disposed at different positions on a first structural member and a second mode in which a standing wave is formed by applying a frequency signal to said first electro-mechanical energy converting part, comprising:

an adjustment circuit arranged to variably adjust the frequency of said frequency signal in said second mode;

monitor means for monitoring a driven state of said motor device; and

setting means for setting a predetermined setting value;

wherein said adjustment circuit is arranged to adjust said frequency in accordance with an output of said monitor means and a setting value set by said setting means such that the output of said monitor means comes into a state corresponding to said setting value.

4,954,743

IGNITER PLUG STRUCTURE HAVING SEMICIRCULAR GROOVES

Takahiro Suzuki; Yiiki Izuoka, and Noboru Aoki, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Dec. 7, 1988, Ser. No. 281,259
Claims priority, application Japan, Dec. 15, 1987, 62-315133
Int. Cl.[5] H01T *13/32, 13/16*
U.S. Cl. 313—120 **3 Claims**

1. An igniter plug structure which comprises: an outer annular metallic shell (1*a*), having an annular ground electrode (2), connected to a lower end of the metallic shell (1*a*), the ground electrode being made of tungsten or tungsten-based alloy, wherein a diameter of the ground electrode is 13 mm or less than 13 mm;

a center electrode (8) is longitudinally located within the centerbore (15), having a firing end which forms a spark gap region with a lower end of the ground electrode (2); and

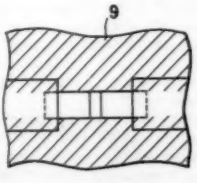
a plurality of grooves (6) provided within an outer surface of the annular ground electrode (2), wherein each groove (6) continuously extends from an upper end of the ground electrode (2), to terminate at the lower end of the ground electrode (2), each groove having a generally semi-circular shape in cross section to allow air flow along the grooves, the number of the grooves (6) is from 4 to 16, and wherein each groove has constant depth and a width from 1.0 mm to 2.5 mm.

4,954,744

ELECTRON-EMITTING DEVICE AND ELECTRON-BEAM GENERATOR MAKING USE

Hidetoshi Suzuki, and Ichiro Nomura, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,175
Claims priority, application Japan, May 26, 1988, 63-126958
Int. Cl.[5] H01J *1/30, 19/10, 19/24*
U.S. Cl. 313—336 **12 Claims**



1. An electron-emitting device, comprising electrodes mutu-

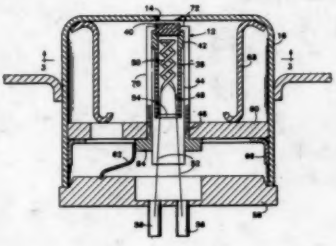
ally opposingly provided in the surface of a substrate, and an electron-emitting area provided between said electrodes, wherein a conductive film having an electrical resistance greater than that of said electron-emitting area and not more than 10^{10} Ω/square is provided on the surface of the substrate at least at the peripheral area of said electron-emitting area in the state that is electrically connected to said electrodes.

4,954,745

CATHODE STRUCTURE

Bernard K. Vancil, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 22, 1989, Ser. No. 327,074
Int. Cl.[5] H01J *29/48, 1/15*
U.S. Cl. 313—446 **16 Claims**



1. A cathode structure for a cathode-ray-tube, said cathode structure generating a beam of electrons at a forward end thereof toward beam accelerating and focusing electrodes disposed between said forward end of said cathode structure and a beam receiving screen in said cathode-ray-tube, said cathode structure comprising:

a cathode body having an electron emissive dispenser cathode portion disposed toward the forward end of said structure comprised of a substance that emits electrons forwardly at very high temperatures for the formation of said electron beam,

said cathode body having a cylindrical heat capturing portion formed of refractory metal joined in heat exchanging relation to said electron emissive portion and extending generally rearwardly therefrom, said heat capturing portion being provided with a cavity adapted for insertably receiving an electrically insulated heater element,

an electrically insulated heater element inserted in said cavity, and

a thin metal tubular skirt element supporting said cathode body from structure of said cathode-ray-tube, said skirt element extending rearwardly from a location of joinder with said cathode body,

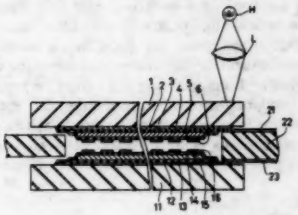
the mass and thickness of said heat capturing portion of said cathode body adjacent said electrically insulated heater element being substantially greater than that of said metal skirt element in supporting relation to said cathode body such that said heat capturing portion provides enhanced conduction of heat to said electron emissive portion while the thinner skirt element provides thermal isolation of said heat capturing portion from the cathode-ray-tube structure.

4,954,746

THIN FILM ELECTROLUMINESCENCE DISPLAYING APPARATUS

Kouji Taniguchi; Takashi Ogura, and Koicji Tanaka, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1988, Ser. No. 235,450
Claims priority, application Japan, Aug. 31, 1987, 62-218923
Int. Cl.[5] H05B *33/02*
U.S. Cl. 313—506 **22 Claims**



1. A multi-layered thin film EL displaying apparatus comprising:

first and second thin film EL elements layered so as to face each other, each including,

a substrate,

a pair of upper and lower electrodes,

an EL layer sandwiched between said upper and lower electrodes, and

an insulating means for insulating said EL layer from each of said electrodes;

connecting means, disposed between said first and second thin film EL elements, for electrically connecting a first pair of said electrodes, one from each of said first and second thin film EL elements, to each other and for electrically insulating a second pair of electrodes, one from each of said first and second EL elements;

said connecting means including,

an insulating layer for insulating said second pair of electrodes from each other,

conductive layers connecting said insulating layer to each one of said first pair of electrodes, and

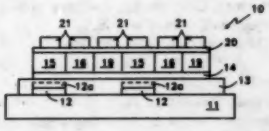
a conductive through-hole in said insulating layer which provides a connection between the conductive layers, and thereby electrically connects said first pair of electrodes with each other.

4,954,747

MULTI-COLORED THIN-FILM ELECTROLUMINESCENT DISPLAY WITH FILTER

Richard T. Tuenge, Rte. 2, Box 1018, Hillsboro, Oreg. 97123, and James Kane, 32 Royal Oak Rd., Lawrenceville, N.J. 08648

Filed Nov. 17, 1988, Ser. No. 272,736
Int. Cl.[5] H01J *1/62*
U.S. Cl. 313—506 **46 Claims**



1. A multi-colored thin-film electroluminescent device comprising:

a substrate;

filter means for filtering light disposed on a first portion of a surface of said substrate;

first electrode means for providing a first selecting potential to said device, said first electrode means being disposed on said surface of said substrate and also overlying said filter means;

first insulator means for insulating said first electrode means, said first insulator means being disposed on said first electrode means;

first means for emitting light, said first light emitting means being disposed on a surface of said first insulator means and in optical alignment with said filter means;

second electrode means for providing a second selecting potential to said device, said second electrode means being disposed adjacent said first light emitting means; and

second insulating means for insulating said first light emitting means from said second electrode means, said second insulating means being disposed between said first light emitting means and said second electrode means.

4,954,748

THYRATRON GAS DISCHARGE DEVICE WITH MAGNETIC FIELD FOR IMPROVED IONIZATION

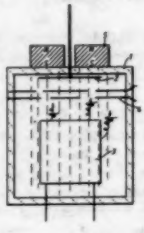
Clifford R. Weatherup, Chelmsford, United Kingdom, assignor to EEV Limited, Chelmsford, United Kingdom

Filed Dec. 2, 1988, Ser. No. 278,892

Claims priority, application United Kingdom, Dec. 5, 1987, 8728503

Int. Cl.[5] H01J *17/14*

U.S. Cl. 313—153 **19 Claims**



1. In a thyratron gas discharge device including an anode, a cathode and a grid structure located between said anode and said cathode; the improvement comprising means arranged to produce a magnetic field within the device such that charged particles of a discharge between said anode and said cathode have a longer path length than they would in the absence of the magnetic field whereby the amount of ionisation within the device is increased.

4,954,749

FLUORESCENT LAMP ELECTRODE DISCONNECT METHOD AND ARRANGEMENT FOR PRACTICING THE METHOD

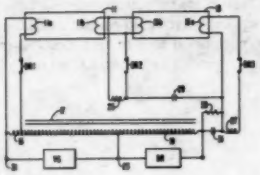
Joseph A. Crawford, Chicago, Ill., assignor to North American Philips Corporation, New York, N.Y.

Filed Nov. 15, 1988, Ser. No. 271,557

Int. Cl.[5] H05B *41/00*

U.S. Cl. 315—97 **21 Claims**

1. A rapid start fluorescent lamp system comprising, a plurality of fluorescent lamps each having a pair of electrodes, a ballast for connection to a source of voltage, said ballast including a primary winding, a secondary winding and a plurality of electrode windings connected to said electrodes, and disconnect means connected in parallel with said secondary winding, said disconnect means being responsive to the voltage across said secondary winding when said plurality of lamps



turn on for interrupting the connection of each of said electrodes to its respective electrode winding.

4,954,750

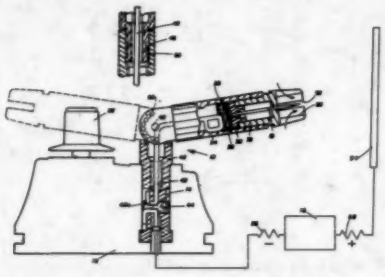
FLEXIBLE ION EMITTER

Albert Barsima..to, 2242 Paradise Dr., Tiburon, Calif. 94920, and Maris Ambats, 77 Bleecker St., Apt. 533, New York, N.Y. 10012

Filed Jul. 7, 1988, Ser. No. 216,096

Int. Cl.[5] H01J *27/02*

U.S. Cl. 315—111.81 **8 Claims**



1. A flexible ion emitter comprising:

a tubular barrel having an open discharge end;

a pointed electrode needle mounted along the axis of said barrel centrally spaced and contained entirely therein with the point thereof near said open end;

a support member;

an ion collector mounted in lateral spaced relation to the other end of said barrel;

said other end being pivotally mounted on said support member so that said barrel may be aimed at a selected angle to said ion collector;

means applying a voltage differential in excess of 5,000 volts to said electrode and said collector so that said electrode will project a stream of ions out said open end of said barrel to said collector.

4,954,751

RADIO FREQUENCY HOLLOW CATHODE

Harold R. Kaufman, 925 Columbia, Apt. 622, Fort Collins, Colo. 80525, and Raymond S. Robinson, 2612 Bradbury Ct., Fort Collins, Colo. 80521

Continuation of Ser. No. 838,765, Mar. 12, 1986, abandoned. This application Oct. 27, 1988, Ser. No. 368,872

Int. Cl.[5] H01J *7/24*

U.S. Cl. 315—111.81 **12 Claims**

1. A cathode assembly comprising:

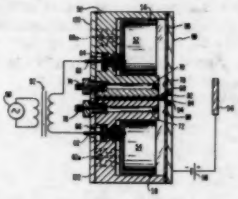
a housing assembly;

a pair of electrodes mutually spaced apart within and electrically isolated from said assembly;

means for introducing an ionizable gas into the said housing

and into the individual vicinity of respective ones of said electrodes;

means for establishing an electrically balanced radio frequency energy discharge between said electrodes to create a plasma exhibiting respective plasma sheaths immedi-



ately adjacent to corresponding different ones of said electrodes beyond which sheaths the radio frequency voltages within said plasma, relative to said assembly, are substantially smaller than those within said sheaths;

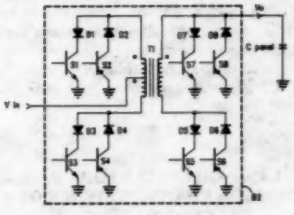
and means for effecting extraction from said assembly of electrons created within said plasma.

4,954,752

ROW DRIVER FOR EL PANELS AND THE LIKE WITH TRANSFORMER COUPLING

Edward L. Young, Shelton, and Mohan L. Kapoor, Orange, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1988, Ser. No. 282,147
Int. Cl.[5] G09G 3/30
U.S. Cl. 315—169.3 **16 Claims**



1. In an electrical display panel system, including:

a display panel having row and column electrodes, said panel being capable of displaying indicia thereon in response to appropriate electrical signals to said row and column electrodes from a row driver and column driver, respectively;

at least one electrical power source (V_{in});

a column driver connected to a power source and being capable of electrically driving said column electrodes; and

an output load, including said row electrodes (C_{panel}) of said panel, which load is essentially capacitive;

a row driver capable of electrically driving said row electrodes, said row driver being powered by said power source; and

row switches causing the drive signals from said row driver to be sequentially pulsed to said row electrodes;

the improvement in said row driver comprising:

a transformer coupling (T_1) being provided between the row driver power source and the capacitive row electrode panel load, said transformer coupling having a primary coil and a secondary coil;

a first switch (S_1 of FIG. 4; S_1 or S_3 of FIG. 6) with unidirectional current flow (D_1 of FIG. 4; D_1 or D_3 of FIG. 6) being connected to one end of said primary coil and to a common primary voltage reference level, with said power source (V_{in}) being connected to a different end of said primary coil; said first switch when closed allowing said power source to provide a current flow through said primary coil, storing energy in it;

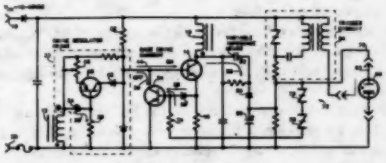
a second switch (S_2 of FIG. 4; S_5 or S_6 of FIG. 6) with unidirectional current flow (D_2; D_5 or D_6) being connected to one end of said secondary coil and to a common secondary voltage reference level, with the row electrode load (C_{panel}) of the panel being connected across said secondary coil and said common secondary voltage reference level; the opening of said first switch causing the electrical energy in said primary coil to be provided to said capacitive row electrode load through said secondary coil, charging and driving said capacitive row electrode load; the closing of said second switch causing the transformer to be re-energized and the voltage across said capacitive row electrode load to at least approach said common secondary voltage reference level; the opening of said second switch allowing the energy restored in the transformer to be dumped back into said power source through said primary coil.

4,954,753

STROBE FLASH LAMP POWER SUPPLY WITH INPUT VOLTAGE FEEDTHROUGH AFTERFLOW PREVENTION CIRCUIT

Scott T. Sikora, Mesa, Ariz., assignor to Tomar Electronics, Inc., Gilbert, Ariz.

Continuation of Ser. No. 42,357, Apr. 24, 1987, Pat. No. 4,775,821, which is a continuation-in-part of Ser. No. 794,415, Nov. 4, 1985, Pat. No. 4,755,723. This application Aug. 29, 1988, Ser. No. 238,039
Int. Cl.[5] H05B 37/02
U.S. Cl. 315—219 **16 Claims**



1. Apparatus for delivering current to an intermittently energized gaseous discharge tube having a low impedance conductive state and a high impedance non-conductive state, comprising:

a. a DC to DC converter for receiving a DC input voltage on a converter input terminal, for generating a pulsed output voltage on a converter output terminal and for periodically energizing the gaseous discharge tube into the low impedance conductive state, the apparatus defining a first current flow path for enabling the DC input voltage to cause a DC current to flow through the converter to the gaseous discharge tube;

b. energy storage means coupled between the converter output terminal and the gaseous discharge tube for periodically receiving and storing energy from the converter when the gaseous discharge tube is in the non-conductive state and for periodically transferring energy into the gaseous discharge tube when the tube is in the conductive state, the apparatus defining a second current flow path from the converter output terminal to the energy storage means and a third current flow path from the energy storage means to the gaseous discharge tube; and

c. a current limiting device coupled in series with the first current flow path between the converter output terminal and the energy storage means for limiting the flow of DC current from the converter input terminal into the gaseous

discharge tube to thereby prevent afterglow of the gaseous discharge tube caused by feedthrough of the DC input voltage.

4,954,754

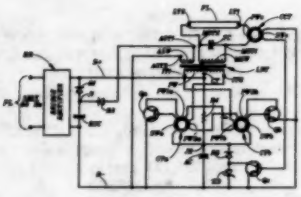
CONTROLLED ELECTRONIC BALLAST

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Filed May 2, 1988, Ser. No. 189,399

Int. Cl.[5] H05B *37/02, 39/04;* G05F *1/00*

U.S. Cl. 315—219 **8 Claims**



1. An arrangement comprising:

a source of AC voltage;

rectifier means connected with the source of AC voltage and operative to provide a first unidirectional current to a pair of DC terminals, there being a main DC voltage present across the DC terminals;

inverter means connected with the DC terminals and operative to provide a high-frequency voltage at a high-frequency output, the frequency of the high-frequency voltage being substantially higher than that of the AC voltage;

tuned L-C circuit means connected with the high-frequency output and operative to provide a high-frequency current at a pair of load terminals;

lamp load means connected with the load terminals, the lamp load means being operative: (i) during certain periods to draw a certain amount of power from the load terminals; and (ii) during certain other periods to draw substantially less than said certain amount of power from the load terminals; and

power feedback means connected in circuit between the high-frequency output and the DC terminals, the power feedback means including a source of auxiliary DC voltage and being operative therefrom to provide a second unidirectional current to the DC terminals, thereby to cause the instantaneous absolute magnitude of the main DC voltage to be approximately equal to the larger of: (i) the instantaneous absolute magnitude of the AC voltage; and (ii) the instantaneous absolute magnitude of the auxiliary DC voltage;

the arrangement being operative to cause the instantaneous absolute magnitude of the auxiliary DC voltage to be: (i) substantially lower than the peak absolute magnitude of the AC voltage during said certain periods; and (ii) substantially equal to the peak absolute magnitude of the AC voltage during said certain other periods.

4,954,755

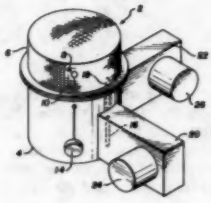
ELECTRODELESS LAMP HAVING HYBRID CAVITY

Donald Lynch, Germantown; Mohammad Kamarehi, Rockville; Michael G. Ury, Bethesda, and Charles H. Wood, Rockville, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Continuation of Ser. No. 865,488, May 21, 1986, Pat. No. 4,749,915, which is a continuation-in-part of Ser. No. 677,137, Nov. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 381,482, May 24, 1983, Pat. No. 4,507,587. This application Apr. 4, 1988, Ser. No. 177,434

Int. Cl.[5] H05B *41/16*

U.S. Cl. 315—248 **6 Claims**



1. An electrodeless light source which is powered by a plurality of means for generating microwave energy, comprising:

a microwave cavity having a cylindrical shape and being comprised of first and second portions of cylindrical shape,

said first cylindrical portion being constructed of a mesh, and said second cylindrical portion being constructed of solid material,

a bulb containing a plasma forming medium disposed in said cavity in or near said first cylindrical portion,

said second cylindrical portion of said cavity having a plurality of coupling slots disposed therein parallel to the cylindrical axis of the cavity,

a waveguide feeding each coupling slot, and

a means for generating microwave energy feeding each waveguide.

4,954,756

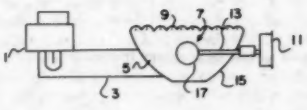
METHOD AND APPARATUS FOR CHANGING THE EMISSION CHARACTERISTICS OF AN ELECTRODELESS LAMP

Charles H. Wood, Rockville, Md., and David Mosher, Falls Church, Va., assignors to Fusion Systems Corporation, Rockville, Md.

Continuation of Ser. No. 73,670, Jul. 15, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,227

Int. Cl.[5] H01J *7/46*

U.S. Cl. 315—39 **7 Claims**



1. A method of changing the emission properties of an electrodeless lamp, said lamp comprising an envelope which contains a plasma-forming medium and means for coupling electromagnetic energy to the medium within said envelope to generate an electric field and form a light-emitting plasma, said method comprising establishing an axis of rotation which is at an angle of between about 30° and 90° with respect to the electric field, and rotating said envelope about said axis at a

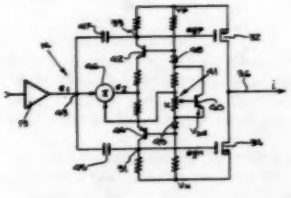
rate of at least about 1000 rpm, said rate being great enough for the centrifugal forces produced thereby to modify surface heating and the distribution of plasma-forming medium about the inner surface of said envelope and concomitantly change the emission properties of the electrodeless lamp, said rotation rate being significantly greater than that which is required to produce a substantially uniform temperature about lines of constant latitude of said envelope while leaving non-uniformities along lines of constant longitude.

4,954,757

LINEAR DEFLECTION AMPLIFIER WITH ENERGY RECOVERY

Ted W. Berwin, Playa del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 27, 1988, Ser. No. 263,459
Int. Cl.[5] H01J *29/70, 29/76*
U.S. Cl. 315—403 **5 Claims**



1. A linear deflection amplifier system, for use in a magnetic deflection CRT, comprising:

a deflection yoke;

amplifier means for receiving a predetermined sweep signal;

power stage means for providing a limited current source, with a dc voltage gain maintained at unity, connected to said amplifier means, wherein said power stage means comprises:

a unity gain amplifier coupled to a first pair of complementary transistors,

said first pair of transistors configured as a Class B amplifier and each of said first pair of transistors coupled to an adjustable temperature compensating means,

a summing amplifier coupled to the output of said unity gain amplifier,

a series circuit linking a second pair of complementary transistors, said series circuit coupled to said summing amplifier and providing a dc signal to said first pair of complementary transistors, and

a current limiting circuit means coupled to said series circuit for limiting the average current through one of said second pair of complementary transistors,

wherein a current source is achieved having low cross-over distortion;

flyback switching means connected to receive current from said power stage means, said flyback switching means positioned between said power stage means and said deflection yoke;

said deflection yoke connected to receive current from said power stage means through said flyback switching means; and

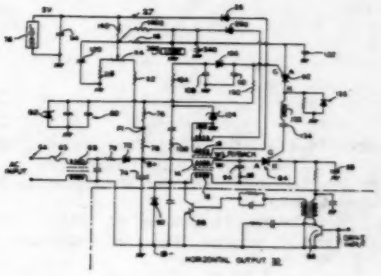
means for feeding back a controlling current signal from said deflection yoke to said amplifier means.

4,954,758

POWER SOURCE CIRCUIT

George R. Rusk, Forest Park, Ill., assignor to Xcel Corporation (Computron Display Systems Division), Pasadena, Calif.

Continuation of Ser. No. 784,697, Oct. 3, 1985, which is a continuation-in-part of Ser. No. 316,952, Oct. 30, 1981, abandoned. This application Oct. 25, 1988, Ser. No. 221,936
Int. Cl.[5] H01J *29/70*
U.S. Cl. 315—411 **2 Claims**



1. A power source circuit comprising:

a horizontal sweep flyback transformer having a magnetic core with an oversized cross section, having wound next to said core a plurality of unitarily-wound power supply windings, having an insulative layer over said power supply windings, having wound over said insulative layer a primary winding, and also having a high-voltage secondary windings and a commutating secondary winding;

a source of alternating current;

rectification means connecting to said source of alternating current for rectifying said alternating current to provide an unregulated direct current potential source;

voltage regulator means for drawing current intermittently from said unregulated direct current potential source and for providing a non-isolated, regulated direct current potential source, said voltage regulator means including a series circuit formed from the flyback transformer's commutating secondary winding and a triggerable controlled conduction device having a trigger input;

a horizontal sweep circuit comprising two circuit elements connected in series across said non-isolated, regulated direct current potential source, the first circuit element comprising the flyback transformer's primary winding, and the second circuit element comprising the parallel combination of an electronic switch operated at the horizontal sweep frequency rate, a damper diode, and a horizontal deflection coil circuit;

high-voltage rectification means connected in series with the flyback transformer's high-voltage secondary winding and oriented to conduct during horizontal retrace intervals, rather than during horizontal scanning intervals, for rectifying the retrace interval voltage peaks;

a plurality of series circuits formed from diode rectifiers connected in series with filter capacitors, each of said series circuits connecting across one or more of said plurality of power supply windings, said series circuit diode rectifiers being oriented to conduct during horizontal scanning intervals, rather than during horizontal retrace intervals, each of said filtering capacitors forming an isolated, regulated direct current potential source;

at least one high wattage load whose wattage needs fluctuate substantially over time connecting to at least one of said isolated, regulated direct current potential sources; and

scan regulator and pulse generation means for regulating said isolated and regulated direct current potential sources by adjusting the timing, relative to the horizontal retrace

interval, of trigger pulses provided to said controlled conduction device, said scan regulator and pulse generation means having a feedback input connecting to at least one of said isolated, regulated direct current potential sources and having a pulse output connecting to said trigger input of said controlled conduction device;

whereby a power supply is achieved in which fluctuations in load currents drawn from the isolated, regulated direct current potential sources do not adversely affect the operation of the high voltage and horizontal deflection circuitry.

4,954,759

CONTROL CIRCUIT FOR AN ELECTROMAGNETIC BREAKING ARRANGEMENT

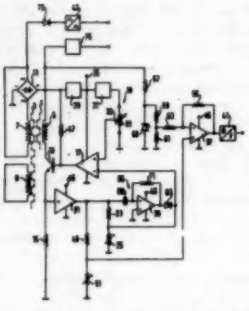
Rainer Fey, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG

Filed Mar. 16, 1988, Ser. No. 168,678

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710842

Int. Cl.[5] H02P *3/00*

U.S. Cl. 318—375 **15 Claims**



1. An electromagnetic braking arrangement, in particular for an ergometer, comprising:

a stator and a rotor movable relative to the stator, the stator and the rotor each having an iron circuit which forms a multipole magnetic flux circuit,

a generator winding and a short-circuited winding on a first one of said iron circuits,

an exciting winding on a second one of said iron circuits and supplied from the generator winding, wherein the second iron circuit has residual magnetic properties and induces magnetic alternating fields in the poles of the first iron circuit,

a control circuit for controlling the current fed to the exciting winding from the generator winding, wherein the control circuit comprises a transistor having a control terminal and two load terminals and an amplifier having operating voltage terminals for supplying a rated operating voltage, said load terminal of the transistor being connected in series with the exciting winding, said control terminal of the transistor being connected to the amplifier and said operating voltage terminals of the amplifier being connected to the generator winding,

and a coupling circuit coupling the control terminal of the transistor also to the generator winding to keep the transistor fully conductive at a generator winding voltage which is lower than the rated operating voltage of the amplifier.

4,954,760

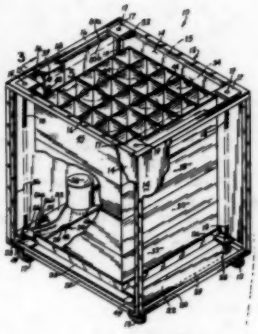
SELF LEVELING DISPENSER

Max G. Futch, 322 Wilton Dr., Baton Rouge, La. 70895, and Ronald H. Drushel, Baton Rouge, La., assignors to Max G. Futch, Baton Rouge, La.

Division of Ser. No. 264,089, Oct. 28, 1988. This application Sep. 25, 1989, Ser. No. 411,668

Int. Cl.[5] B65G *1/07*; A47F *10/06*

U.S. Cl. 318—480 **4 Claims**



1. An electronic circuit for a self leveling dispenser, the dispenser having a rack vertically movable relative to ground, and being adapted to support a desired number of trays in stacked arrangement one on top of the other, said circuit comprising:

a sensing device located above said rack, said device functioning to sense the presence and absence of trays at the vertical location of said sensing device, and

a reversible motor electrically connected to said sensing device and drivably connected to said rack, said sensing device and said motor cooperatively functioning to automatically and continuously reposition said rack as required so that a top tray on said rack will be located at a desired dispensing height relative to ground.

4,954,761

CONTROL SYSTEM OF AN INDUSTRIAL ROBOT

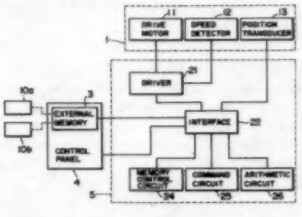
Yutaka Kimura; Hiroshi Okumura; Hirokata Mihara, and Mitsutoshi Yoshida, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo K. K., Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,266

Claims priority, application Japan, Oct. 23, 1987, 62-266526; Nov. 16, 1987, 62-174802[U]

Int. Cl.[5] G05B *19/18*

U.S. Cl. 318—568.1 **2 Claims**



1. A control system of an industrial robot in which an operation program of the robot is read out from a storage medium and is processed to obtain data to control a robot machine on the basis of the data, said robot being characterized in

external memory means for selectively reading out a program from a plurality of stored operation programs said external memory means including a data transmission device for transmitting the program,

control means, including an IC card loader, for supplying the operation program to control the robot machine, and

a data transmission cable having a connection terminal mounted at one end thereof for insertion into said IC card loader to connect between said data transmission device and said IC card loader and for supplying the operation program from said external memory means through the data transmission cable to said control means.

4,954,762

METHOD AND APPARATUS FOR CONTROLLING TRACKING PATH OF WORKING POINT OF INDUSTRIAL ROBOT

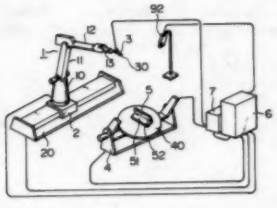
Norihisa Miyake, Matsudo; Masaki Sumita, Yachiyo, and Shinichi Sarugaku, Funabashi, all of Japan, assignors to Hitachi, Ltd, Tokyo and Hitachi Keiyo Engineering Co., Ltd., Narashino, both of, Japan

Filed Jan. 30, 1990, Ser. No. 472,082

Claims priority, application Japan, Feb. 1, 1989, 01-020712

Int. Cl.[5] G06F *15/46*

U.S. Cl. 318—568.19 **9 Claims**



1. A method for controlling a tracking path of a working element so that the working element moves along a path having a predetermined positional relationship with a working object by adjusting the relative positional relationship between the working element and the working object through the movement of individually movable at least one moving element each being operatively coupled with either the working element or the working object in a prescribed coupling condition, comprising the steps of:

allotting individual coordinate systems each having a discriminator to said working element, said working object and said moving elements to provide the coordinate systems with the corresponding discriminators;

setting as a coordinate system expressing the data for controlling the movement of said working element a first coordinate system selected from said coordinate systems;

describing, using a second coordinate system selected from the coordinate systems, the data representing the positions of the working element corresponding to specific points on the tracking path along which said working element is to move on the basis of a prescribed working schedule to store the data together with the discriminator representative of the corresponding coordinate system;

deciding in executing a real work if or not said first coordinate system and said second coordinate system are the same from their discriminator; and

if both coordinate systems are different coordinate systems, converting the position data of the working element corresponding to the specific points into the data expressed in the first coordinate system and controlling the movement of said working element on the basis of the converted data.

4,954,763

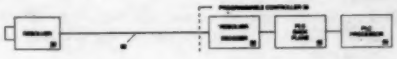
RESOLVER ANALOG TO DIGITAL INPUT MODULE FOR USE IN A PROGRAMMABLE CONTROLLER SYSTEM

Shalabh Kumar, Kildeer, and Duane Edgar, Lisle, both of Ill., assignors to Micro Fast Controls, Inc., Carol Stream, Ill.

Filed Jan. 31, 1989, Ser. No. 304,144

Int. Cl.[5] G05B *19/31*

U.S. Cl. 318—605 **21 Claims**



1. A programmable controller system which is coupled to a resolver, said system including a rack mounting circuit modules and having a PLC backplane (a circuit connector board), a programmable controller logic processor connected to said backplane, a resolver analog-to-digital decoder circuit module mountable in said rack for being coupled directly to and through said PLC backplane to said logic processor, and transmission line coupling means for coupling analog output signals from a resolver to said resolver analog-to-digital decoder circuit module forming part of said controller system.

4,954,764

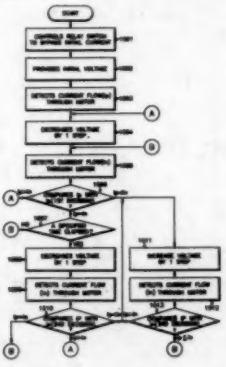
CIRCUIT AND METHOD FOR POWER EFFICIENCY IMPROVEMENT OF INDUCTION MOTORS

Jung-Soo Kim, Suwon, Rep. of Korea, assignor to SamSung Electronic Co., Ltd., Suwon Kyung Ki-Do, Rep. of Korea

Filed Dec. 30, 1987, Ser. No. 139,735

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—798 **18 Claims**



1. In a power control system equipped with a microcomputer consisting of a separate ROM and RAM memory and a microprocessor to execute instructions and an AC induction motor, an electronic circuit for improving power efficiency, comprising:

power controller means for making induction current freewheeling and for controlling source voltage input to maintain an optimum state in accordance with loading by performing alternating PWM chopping;

zero-crossing detector means for generating a zero crossing signal of a definite pulse width at zero crossing points of an alternating voltage waveform;

starting protector means for preventing destruction of a device by bypassing starting current through an induction motor during an initial transient state;

relay controller means for controlling said starting protector

means to bypass said starting current for a specified period of time during an initial start-up;

combination logic means for combining said zero crossing signal with a PWM waveform to produce first output signals;

coupling buffer means for controlling and buffering said first output signals from said combination logic means to provide second output signals;

base driver means for controlling said power controller means with said second output signals from said coupling buffer means;

current/voltage converter means for detecting load current of said induction motor and converting said load current to voltage;

digital/analog converter means adapted to convert digital reference data into analog values;

a comparator to compare said voltage converted in said current/voltage converter means with said analog value of said digital/analog converter means; and

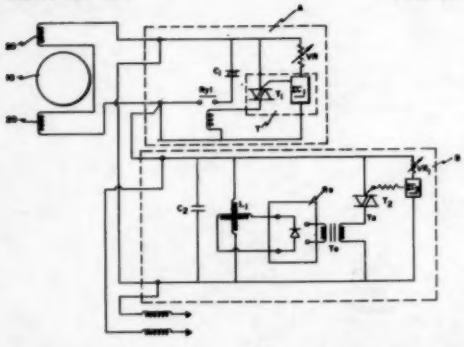
a microprocessor coupled to receive said zero crossing signal, provide a transient state indicating signal to said relay controller means, receive a comparison signal provided by said comparator means by comparing said voltage converted in said current/voltage converter means with said analog value, provide and periodically vary on the basis of said comparison signal provided by said comparator means the value of said digital reference data to said digital/analog converter means, and provide said PWM waveform to said combination logic means in response to reception of said zero crossing signal.

4,954,765

FULLY AUTOMATIC PHASE CONTROLLER FOR A NON-COIL ARMATURE TYPE GENERATOR

Long-Hai Hu, No. 9, 2 Road, Industry District, Taichung City, Taiwan

Filed Jun. 29, 1989, Ser. No. 372,758
Int. Cl.[5] G05F 5/00
U.S. Cl. 323—217 **2 Claims**



1. An automatic phase controller for a non-coil armature-type generator, comprising:

a starting control circuit, including a first capacitor electrically connected between a first stator coil and a relay, a first variable resistor connected to the first stator coil for setting a desired starting voltage, a first TRIAC switch controller comprising a first TRIAC electrically connected between said first stator coil and the control terminal of said relay and a first voltage stabilizer arranged to trigger said first TRIAC when the voltage across said first variable resistor reaches said desired starting voltage, whereby said first TRIAC opens said relay when triggered said first voltage stabilizer; and

an automatic voltage control circuit, including a second variable resistor electrically connected to the output of said starting control circuit, a second TRIAC switch controller comprising a second voltage stabilizer and a second TRIAC, a second transformer electrically connected between said second TRIAC and said generator, a second capacitor arranged in parallel with said generator; and

an inductive magnetic saturation regulator arranged in parallel with said generator;

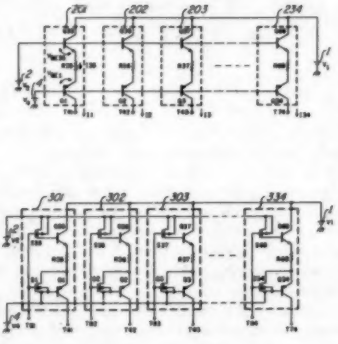
whereby said second TRIAC switch controller is arranged to induce a current to flow in said magnetic saturation regulator so that said magnetic saturation regulator shifts the generator output current phase a desired amount in accordance with the values of said second capacitor and said second variable resistor, said generator output current flowing only when said relay is opened.

4,954,766

POWER SUPPLY CIRCUIT AND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE USING IT

Shuichi Ishikawa, Kawasaki, and Hiromichi Kuwano, Tokyo, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 10, 1989, Ser. No. 377,508
Claims priority, application Japan, Jul. 11, 1988, 63-172481
Int. Cl.[5] G05F 1/56
U.S. Cl. 323—272 **12 Claims**



1. A power supply circuit comprising:

a first bipolar transistor;

a second bipolar transistor having a polarity opposite to that of said first bipolar transistor;

each of said first and second bipolar transistors having an emitter, a base and a collector;

one of the emitter and the collector of said first bipolar transistor being the input thereof and being connectable to a power supply for controlling the voltage change of the power supply;

said one of the emitter and the collector of said second bipolar transistor being the output thereof and being connectable to an output terminal; and

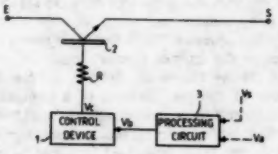
a resistor interposed between said first and second bipolar transistors and being connected at one end thereof to the other of the emitter and the collector of said first bipolar transistor as the output thereof and at the other end thereof to the said other of the emitter and the collector of said second bipolar transistor as the input thereof for controlling the voltage change of the power supply.

4,954,767

CONTROL DEVICE FOR SWITCHED POWER SUPPLY

Jean-Michel Buisson, Colombes, and Jean-Marie Soubrier, Gentilly, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Jan. 8, 1990, Ser. No. 461,690
Claims priority, application France, Jan. 20, 1989, 89 00687
Int. Cl.[5] G05F 1/575
U.S. Cl. 323—283 4 Claims



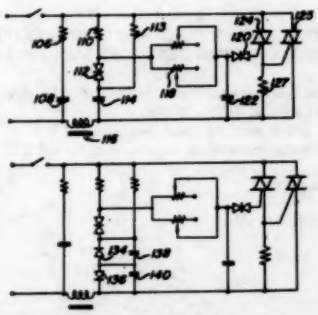
1. A device for the control of a switched supply, this supply receiving a voltage to be cut off and comprising a processing circuit to give a signal with an index value to the control device, and a switching circuit to cut off the voltage under the control of a switching signal, the control device comprising a first memory circuit containing pre-programmed zones to give, as a signal, the switching signal, a second memory circuit to make a pre-determined zone, among the pre-programmed zones, correspond to each value of the signal with an index value and reading means for the cyclical reading of the pre-determined zone.

4,954,768

TWO WIRE LOW VOLTAGE DIMMER

David G. Lachaco, Macungie, Pa., and Charles C. Houng, Clinton, N.J., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Division of Ser. No. 122,588, Nov. 17, 1987, Pat. No. 4,876,498, which is a continuation of Ser. No. 839,304, Mar. 13, 1986, abandoned. This application May 26, 1989, Ser. No. 358,329
Int. Cl.[5] G05F 5/02
U.S. Cl. 323—300 20 Claims



1. In a two wire AC dimming circuit of the type having electronic bidirectional switch means with control input means for selectively rendering the electronic switch means conductive according to repetitive timed control signals applied to the control input means to control the RMS value of an AC voltage applied to the load, a circuit for regulating the RMS value of the AC voltage applied to the load and for decreasing damaging DC current caused by loads having both resistive and inductive components comprising:

(a) first means for providing a signal having a value indicative of a DC current flowing through the load;

(b) second means responsive to the signal provided by the first means for adjusting the timing of the control signals during selected half cycles of the waveform of the AC voltage applied to the load to decrease the DC current flowing through the load; and

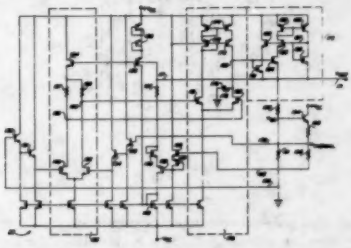
(c) third means in electrical series with the first means for automatically adjusting the timing of the control signals in response to fluctuations in the AC voltage supplied to the dimmer to thereby regulate the RMS value of the AC voltage applied to the load.

4,954,769

CMOS VOLTAGE REFERENCE AND BUFFER CIRCUIT

Timothy V. Kalthoff, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 8, 1989, Ser. No. 308,109
Int. Cl.[5] G05F 3/30
U.S. Cl. 323—313 21 Claims



1. A voltage reference circuit that is resistant to power supply noise, comprising in combination:

(a) a band gap circuit including first and second transistors having different current densities therein and having a resistor coupled between a base of the first transistor and a base of the second transistor, a first FET differential amplifier circuit having first and second input terminals coupled to an emitter of the first transistor and an emitter of the second transistor, respectively;

(b) a first FET having a gate coupled to an output of the first FET differential amplifier circuit and a source coupled to a first output conductor and producing thereon a first reference voltage;

(c) feedback means coupled to the output of the first FET differential amplifier circuit for applying a portion of the first reference voltage to maintain a $V_{THERMAL}$ voltage across the resistor equal to the difference between a V_{BE} voltage of the first transistor and a V_{BE} voltage of the second transistor so as to maintain equal voltages on the first and second input terminals;

(d) a power supply noise rejection circuit including

i. a second FET having a gate coupled to the output of the first FET differential amplifier circuit and a source coupled to the first output conductor, the second FET having a channel width-to-length ratio substantially less than a channel width-to-length ratio of the first FET,

ii. a first cascode FET coupling a drain of the first FET to a first supply voltage conductor,

iii. a second cascode FET having a source coupled to a drain of the second FET,

iv. a third FET having a source coupled to the first supply voltage conductor, and a gate and a drain coupled to a drain of the second cascode FET,

v. a fourth FET having a source coupled to the first supply voltage conductor and a gate coupled to the gate of the third FET, and a drain coupled to the gate of the first and second cascode FETs,

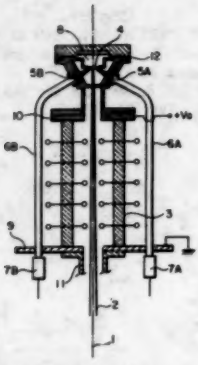
vi. a fifth FET having a gate and drain coupled to the gate of the first and second cascode FETs and a source coupled to the first output conductor.

4,954,770

SPIN-POLARIZATION DETECTOR

Hideo Matsuyama, Kokubunji; Kazuyuki Koike, Tokyo, and Kazunobu Hayakawa, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 310,896
Claims priority, application Japan, Feb. 26, 1988, 63-41991
Int. Cl.[5] G01N *23/00*
U.S. Cl. 324—71.3 12 Claims



1. A spin-polarization detector comprising:

acceleration means applying a high voltage for accelerating a measured electron beam having spin polarization;

a metal target for scattering the accelerated electron beam; and

a fluorescent screen for detecting the intensity of an electron beam scattered from the metal target, and optical signal from the fluorescent screen being transmitted to photoelectric conversion means through an optical guide, to be converted into an electric signal,

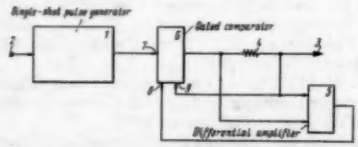
wherein the fluorescent screen is disposed in a region which exists in the neighborhood of the metal target and is supplied with said high voltage by means of the acceleration means, the fluorescent screen and the metal target being applied with said high voltage, and wherein the photoelectric conversion means is disposed in a region applied with a ground potential.

4,954,771

STIMULUS GENERATOR

Jury L. Spirin, ulitsa Martenovskaya, 7, kv. 38; Jury M. Korhashov, ulitsa Taganskaya, 24, korpus 5, kv. 39; Konstantin V. Semin, shosse Entuziastov, 24/43, kv. 34, and Alexandr S. Sigov, ulitsa Akademika Piljugina, 8, kv. 91, all of Moscow, U.S.S.R.

Filed Sep. 23, 1988, Ser. No. 249,351
Int. Cl.[5] G01R *29/02*
U.S. Cl. 324—158 R 1 Claim



1. A stimulus generator intended to induce a stimulating pulse in a selected point of the circuit under test by means of an output electric signal of this generator, with the pulse voltage level adaptable to variations of electric parameters of the circuit under test, these variations evidenced during transistion of reversible (self-healing) electric breakdown of a p-n junction to an irreversible thermal breakdown of the junction, and comprising:

single-shot pulse generator means for generating an initial signal which sets a maximally possible duration of an operational cycle of the stimulus generator, said single-shot pulse generator means being equipped with a trigger signal input and an output;

control bus means for setting the start of generation of the initial signal;

probe means for directly introducing said output electric signal of the stimulus generator into the selected point of the said circuit under test;

measuring resistor means for detecting a pattern of current variations of the output electric signal of the stimulus generator during transistion from a self-healing electric breakdown of the p-n junction of a component of the circuit under test to an irreversible thermal breakdown of this junction, said measuring resistor means provided with first and second leads, with said first lead of said measuring resistor means connected to said probe means;

differential amplifier means for amplifying a voltage drop across said measuring resistor means, said amplifier means provided with first and second inputs and an output, with said first input of said differential amplifier means connected to said first lead of said measuring resistor means, and said second input of said differential amplifier means connected to said second lead of said measuring resistor means; and

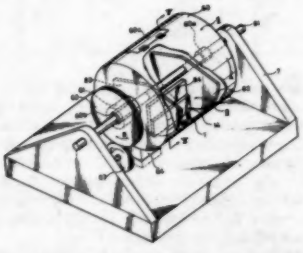
gated comparator means for identifying the moment of onset of mismatch between the patterns of variation of current and voltage of the output signal of the stimulus generator, these patterns being registered by said differential amplifier means, said gated comparator means being provided with first, second, and third inputs and an output, with said first input of said gated comparator means connected to said output of the single-shot pulse generator means, said second input of said gated comparator means connected to said output of said differential amplifier means, said third input of said gated comparator means connected to said first lead of said measuring resistor means, and said output connected to the second lead of said measuring resistor means, so that the output is connected to said circuit under test through said measuring resistor means.

4,954,772

TEST METHOD OF AN ELECTROSTATIC BREAKDOWN OF A SEMICONDUCTOR DEVICE AND AN APPARATUS THEREFOR

Haruo Funakoshi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 167,793
Claims priority, application Japan, Nov. 12, 1987, 52-287985
Int. Cl.[5] G01R *31/26*
U.S. Cl. 324—158 R 16 Claims



1. For a method of testing an electrostatic breakdown of a semiconductor device being incorporated in a package and having lead terminals mounted on said package in an aligned

orientation and connected to a semiconductor chip in said semiconductor device, by electrostatically discharging said semiconductor deice in said package to perform a test to determine whether an electrostatic breakdown is caused in said semiconductor device, a method of charging and discharging said device, comprising the steps of:

disposing a plurality of said semiconductor devices such that said aligned orientations thereof form random angles with respect to each other on a main surface of a member electrostatically charged with a predetermined voltage;

moving said semiconductor devices on the main surface of said member and mutually contacting said lead terminals of different ones of said semiconductor devices to causes discharge to said semiconductor devices; and

removing the static electricity which has been charged in said semiconductor devices.

4,954,773

VOLTAGE MEASUREMENT WITH AN ELECTRON PROBE WITHOUT EXTERNAL TRIGGER SIGNAL

Hans D. Brust, Dudweiler, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1988, Ser. No. 227,304

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726234

Int. Cl.[5] G01R *19/28*

U.S. Cl. 324—158 R **22 Claims**

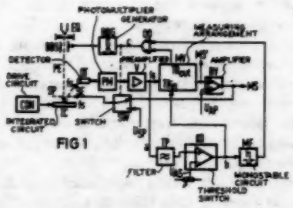


FIG 1

1. A method for voltage measurement with a particle probe without an external trigger signal, comprising the steps of:

charging a point on a sample carrying a first signal with a continuous primary beam;

deriving a secondary signal from the point;

supplying the secondary signal to a measurement processing unit;

obtaining from the secondary signal a first trigger signal which is synchronous to the first signal;

blanking of the primary beam for a first time interval, said blanking caused by the first trigger signal;

causing a second trigger signal by the first trigger signal, the second trigger signal causing generation of a pulse of the primary beam within the first time interval; and

providing a measurement signal from the secondary signal.

4,954,774

AUTOMATIC CONTROL SYSTEM OF INTEGRATED CIRCUITS

Michel Binet, Tournan, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 13, 1989, Ser. No. 366,106

Claims priority, application France, Jun. 24, 1988, 88 08502

Int. Cl.[5] G01R *35/00, 31/06*

U.S. Cl. 324—158 F **8 Claims**

1. A system for testing of integrated circuits on a wafer comprising

(a) chamber means for enclosing wafer testing equipment,

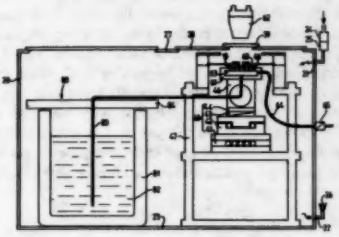
(b) at least one inlet nozzle means for introducing inert dry gas into said chamber means,

(c) at least one exhaust nozzle means for exhausting said inert dry gas from said chamber means,

(d) means connected to said at least one exhaust nozzle means for controlling and maintaining an excess pressure of said inert dry gas in said chamber means,

(e) sample carrier means inside said chamber means for supporting a wafer having integrated circuits, said sample carrier means including a cooling cavity,

(f) probe card means inside said chamber means for applying electrical connections to said wafer,



(g) mechanical means inside said chamber means for displacing in a controlled manner said sample carrier means relative to said probe card means,

(h) container means inside said chamber means for holding cooling liquid, said container means including a top cover, and

(i) tube means extending through said top cover into said container means for conducting said cooling liquid from said container means to said cooling cavity, said tube means including further means for conducting liquid and vapor from said cooling cavity to an exhaust structure.

4,954,775

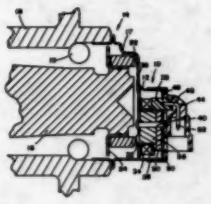
AUTOMOTIVE WHEEL SPEED SENSOR ASSEMBLY WITH MULTIPOLE ROTOR MOUNTED ON WHEEL BEARING SPINDLE

James W. Richmond, Carmel, Ind., assignor to Emhart Industries Inc., Towson, Md.

Division of Ser. No. 171,162, Mar. 21, 1988, Pat. No. 4,904,936, which is a continuation of Ser. No. 835,514, Mar. 3, 1986, abandoned. This application Feb. 6, 1989, Ser. No. 306,086

Int. Cl.[5] G01P *3/488*

U.S. Cl. 324—174 **3 Claims**



1. The combination of a vehicle wheel speed sensor with a vehicle wheel assembly, said combination comprising:

a wheel bearing housing;

a wheel bearing spindle rotatable about an axis in said wheel bearing housing;

rotor means fixedly mounted on said spindle for providing one or more poles that rotate with said spindle;

stator means for providing one or more poles that do not

rotate with said spindle, said stator means including a field coil for sensing a changing magnetic flux;

magnetic means mounted on said stator for providing a magnetic flux through said rotor means and said stator means, said magnetic means comprising;

a magnet for producing said magnetic flux;

ferromagnetic means for causing said magnetic flux to sweep through said field coil when said one or more rotor poles move from a position in which they are aligned with said one or more stator poles to a position in which they are not so aligned; and

flange means attached to and encircling said spindle about a radius that is further from said axis of said spindle than said one or more rotor poles and for providing a flux path from said one or more rotor poles to said magnet;

support means for fixedly supporting said stator means on said housing so that as said spindle turns said one or more rotor poles are at times aligned with said one or more stator poles across on air gap and at other times are no aligned across said air gap, said air gap being substantially in a plane perpendicular to said axis about which said spindle rotates.

4,954,776

LINEAR DISPLACEMENT TRANSDUCERS UTILIZING VOLTAGE COMPONENT IN PHASE WITH CURRENT THAT VARIES LINEARLY WITH CORE DISPLACEMENT

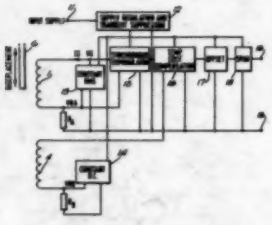
Stephen Hasher, Fordingbridge, United Kingdom, assignor to Penny & Giles Controls Limited, Dorset, United Kingdom

Filed Feb. 21, 1989, Ser. No. 313,034

Claims priority, application United Kingdom, Apr. 22, 1988, 8809575

Int. Cl.[5] G01B 7/14

U.S. Cl. 324—20716 **6 Claims**



1. A linear displacement transducer comprising:

a winding;

a magnetic core which is linearly displaceable relative to said winding; and

means for energizing said winding with a constant RMS alternating current of a fixed frequency sufficiently high for the losses in said magnetic core to cause the voltage across said winding in phase with the current to vary substantially linearly relative to the linear displacement of said magnetic core.

4,954,777

DEVICE FOR DEFECT TESTING OF NON-FERROMAGNETIC TEST SAMPLES AND FOR FERROMAGNETIC INCLUSIONS

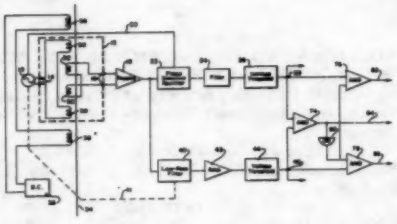
Walter Klopfer, Mossingen; Fritz Haug, Pliezhausen, both of Fed. Rep. of Germany; Dale Gabauer, Freedom, and James Workley, Imperial, both of Pa., assignors to Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 282,450

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743521

Int. Cl.[5] G01N 27/82, 27/90

U.S. Cl. 324—232 **1 Claim**



1. A device for defect testing of non-ferromagnetic test samples and for the presence of ferromagnetic inclusions in said test samples, comprising:

means for inducing alternating eddy currents in the test samples including a coil arrangement energized by a selectively variable alternating current generator;

a permanent magnet yoke of such strength as to produce magnetic saturation of ferromagnetic samples for inducing a constant D.C field in the test samples at the same time as the alternating eddy currents;

receiver coil means including two spaced apart differentially connected receiver coils coupled to the test samples for developing a first signal corresponding to the reaction of alternating eddy currents with the non-ferromagnetic test samples and a second signal corresponding to a reaction of the D.C. field in the test samples with a ferromagnetic inclusion, said first and second signals existing in composite form;

a first thresholded circuit connected to the receiver coil means for producing a third signal responsive to the first signal indicating the presence of a physical defect in the non-ferromagnetic test sample;

a second thresholded circuit including a low-pass filter connected to the receiver coil means for preventing passage of the first signal and for producing a fourth signal responsive to the second signal to indicate the presence of a ferromagnetic inclusion in the test samples, said low-pass filter being variable in common with the current generator;

a preamplifier interconnected between the receiver coil means and the first and second circuits;

a logic circuit fed by both the third and fourth signals for producing a fifth signal indicating the presence of both the third and fourth signals; and

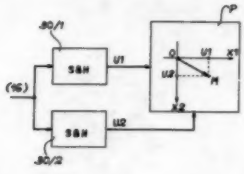
means responsive to said third, fourth and fifth signals for providing sixth, seventh and eighth signals indicative of, respectively, the existence of a defect only in a material separation or inhomogeneity of the surface of the sample not in the presence of a ferromagneetic inclusion, the existence of a ferromagnetic inclusion underneath the sample surface, and the existence of a ferromagnetic inclusion with surface contact.

4,954,778

EDDY CURRENT TESTING SYSTEM USING TWO SAMPLES WITH DIFFERENT TIME LAGS

Francois Champonnois, Paris; Bernard David, Gif/Yvette, and Francis Joffre, Bures sur Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 16, 1989, Ser. No. 311,356
Claims priority, application France, Feb. 26, 1988, 88 02377
Int. Cl.[5] G01N *27/90*; G01R *33/12*
U.S. Cl. 324—233 16 Claims



9. Pulsed eddy current testing apparatus comprising:

a probe having first and second coils positioned facing a part to be inspected,

a generator for emitting at least one pulse of predetermined shape and duration, said pulse being applied to said first coil of said probe,

at least two sample and hold channels having an input connected to said second coil of said probe, said channels sampling a measuring pulse at different instants designated by a time lag counted from the start of the measuring pulse supplied by the probe and holding the sampled amplitude,

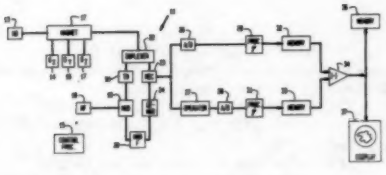
means for displaying a point having for the first coordinate on a first axis one of the sampled and held amplitudes obtained with a short sampling lag and as the second coordinate along a second axis a second sample and held amplitude obtained with a long sampling lag.

4,954,779

CORRECTION FOR EDDY CURRENT CAUSED PHASE DEGRADATION

Yuval Zur, Herzliya, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Apr. 28, 1989, Ser. No. 344,806
Claims priority, application Israel, Apr. 29, 1988, 86231
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—306 12 Claims



7. A system for correcting for eddy current caused phase distortions in magnetic resonance images, said system comprising:

means for acquiring normal resolution time domain magnetic resonance imaging (MRI) data,

means for acquiring low resolution time domain magnetic resonance imaging (MRI) data,

means for Fourier transforming the normal resolution time domain MRI data,

means for Fourier transforming the low resolution MRI data,

means for obtaining the phase images in the frequency domain after the steps of Fourier transforming, and

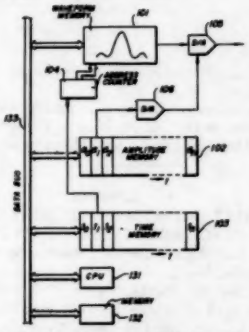
means for subtracting the phase image of the low resolution data from the phase image of the normal resolution data to provide a phase image corrected for eddy current caused phase distortion.

4,954,780

SCAN CONTROLLER FOR NMR IMAGING DEVICE

Toru Shimazaki, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 251,226, Jul. 22, 1988, abandoned. This application Aug. 23, 1989, Ser. No. 397,402
Claims priority, application Japan, Jan. 29, 1986, 61-17371
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 4 Claims



1. A scan controller for use in an NMR imaging device to control high frequency pulses and/or gradient magnetic fields, said controller comprising

waveform memory means for storing control signal waveforms;

amplitude memory means for storing control signal amplitudes;

time memory means for storing control signal durations;

central processing means for causing the reading out of said waveform memory means, said amplitude memory means, and said time memory means;

address counter for assigning addresses to parts of said waveform in said waveform memory means as related to a cycle represented by values read out from said time memory means, so that said central processing means reads out from said waveform memory means and said amplitude memory means values of signals stored therein in a specified order of events; and

means for multiplying the read out values from said amplitude memory means and the read out values from said waveform memory means and for producing an output signal representing the multiplied product with a value representing the amplitude of the control signal stored in said amplitude memory means.

4,954,781

NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS WITH REDUCED ACOUSTIC NOISE

Haruhiko Hirata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 8, 1989, Ser. No. 362,950
Claims priority, application Japan, Jun. 14, 1988, 63-144887
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 25 Claims

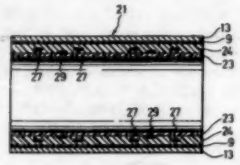
1. A nuclear magnetic resonance imaging apparatus, comprising:

a main magnet for generating a static magnetic field in a measurement space in which a body to be examined is to be placed;

gradient coil means for producing gradient magnetic fields over the static magnetic field;

means for detecting signals from the body in the static and gradient magnetic fields due to a nuclear magnetic resonance phenomenon;

means for processing the detected signals so as to obtain



tomographic images of the body at arbitrary cross sections; and

a sandwich structure which is located between the body and the main magnet, comprising a viscoelastic layer sandwiched by a first and a second sandwiching members.

4,954,782

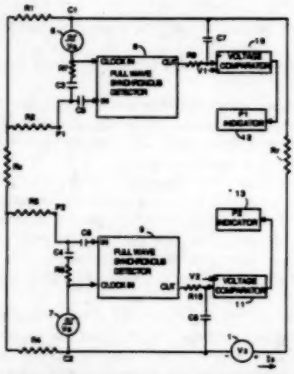
SELF-CHECKING OHMMETER THAT CHECKS FOR CONTACT RESISTANCE OF ITS PROBES

Edward R. Ball, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 48,021, May 8, 1987, Pat. No. 4,876,515. This application Jun. 29, 1989, Ser. No. 374,486

Int. Cl.[5] G01R 27/14

U.S. Cl. 324—538 **14 Claims**



1. A four terminal ohmmeter apparatus including a source of voltage, a reference resistance in series with said source of voltage, means for determining the voltage across said reference resistance, current terminal means terminating the series circuit including said source of voltage and said reference resistance, said current terminal means being provided with manually operable current connecting means, potential terminal means and means for determining the voltage thereacross, said potential terminal means being provided with manually operable potential connecting means, wherein said current and potential connecting means are adapted to provide conductive connection with means under test, said connection being characterized as resistive, said ohmmeter apparatus further comprising:

means coupled to said current terminal means for determining the voltage thereacross when said connecting means are applied to means under test,

means coupled to said potential terminal means for determining voltages at said potential terminal means when said connecting means are applied to means under test, and

indicating means for providing notification when the voltage across said current terminal means is within predetermined acceptable limits and when voltages at said potential terminal means are within predetermined acceptable limits.

4,954,783

APPARATUS AND METHOD FOR TESTING MOISTURE OF EAR CORN

Robert H. Spry, 21 Sunset Rd., Bloomington, Ill. 61701

Filed Aug. 28, 1989, Ser. No. 398,714

Int. Cl.[5] G01R 27/22

U.S. Cl. 324—696 **17 Claims**

1. A corn moisture tester for measuring the moisture content of corn kernels on an ear of corn, said ear of corn defining a longitudinal ear axis and having a cob and a plurality of said corn kernels over the surface of said cob in a plurality of rows, said rows extending in the general direction of said ear axis and each of said kernels having an exterior pericarp and an interior endosperm, said moisture tester comprising:

a moisture tester for vegetable matter having a pair of terminals, meter means for measuring an electrical property of said matter, and a visual display;

cradle means for receiving and partially enveloping an ear of corn;

a pair of electrodes held by said cradle means at a fixed spacing and in electrical communication with said terminals, said electrodes being constructed and arranged such that each electrode pierces the pericarp of at least one of said kernels and is in electrical contact with the endosperm of at least one kernel, without contacting said cob when said ear of corn is received in said cradle;

said display generating a signal representative of the moisture content of said corn.

4,954,784

PHASE ADJUSTMENT CIRCUIT

Tsutomu Kitamura, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

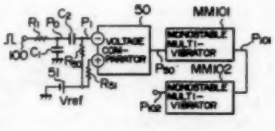
PCT No. PCT/JP88/01146, § 371 Date Jul. 7, 1989, § 102(e) Date Jul. 7, 1989, PCT Pub. No. WO89/05081, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 14, 1988, Ser. No. 381,641

Claims priority, application Japan, Nov. 16, 1987, 62-288770

Int. Cl.[5] H03K 5/13, 5/159

U.S. Cl. 328—155 **2 Claims**



1. A phase adjustment circuit comprising: an input terminal for inputting a synchronizing signal thereto; an integration

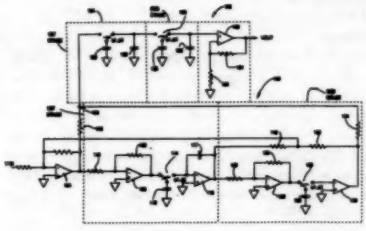
circuit having an input side thereof connected to said input terminal; a d.c. blocking capacitor having one end thereof connected to an output side of said integration circuit; a voltage comparator having both first and second input terminals thereof connected to the same reference d.c. voltage source through respective resistors and having one of said first and second input terminals connected to the other end of said d.c. blocking capacitor and producing an output pulse signal having a pulse width substantially equal to one half period of the synchronizing signal; and a delay circuit which is triggered by the output pulse signal from said voltage comparator to produce a pseudo synchronizing signal.

4,954,785

AUTO TRACKING NOTCH FILTER USING SWITCHED CAPACITORS TO MEASURE HARMONIC DISTORTION AND NOISE CONTAINED IN A SIGNAL SOURCE

Para Segaram, Campbell, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 12, 1989, Ser. No. 337,082
Int. Cl.[5] H03B 1/04; H03H 7/12
U.S. Cl. 328—167 **32 Claims**



1. A tunable filter having a filter characteristic tracking an input signal comprising:

a signal source providing a variable frequency signal to be tracked by the filter characteristic;

a frequency detector, coupled to the signal source, for producing a detector output signal which is a function of the frequency of the variable frequency signal;

means, responsive to the frequency detector output signal, for generating at least one switching signal having a variable frequency proportional to the detector output signal;

a first capacitor having a first terminal coupled to a reference potential and a second terminal; and

first switching means, having an input coupled to the variable frequency signal, responsive to the at least one switching signal, and in response to changes in level of the at least one switching signal alternately coupling the input of the first switching means to the second terminal of the first capacitor and coupling the second terminal of the first capacitor to an output of the first switching means coupled to an output of the filter.

4,954,786

OPTICAL AMPLIFYING DEVICE

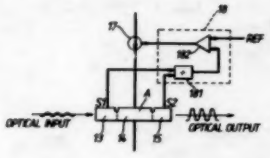
Hideaki Yamakawa; Nobuo Suzuki, both of Tokyo, and Takeshi Ozeki, Saitama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1989, Ser. No. 446,095
Claims priority, application Japan, Jan. 12, 1989, 1-5422
Int. Cl.[5] G01J 1/32; H01S 3/103
U.S. Cl. 330—4.3 **23 Claims**

1. A device for amplifying an input optical signal comprising:

optical amplifying means having a gain control portion for amplifying the input optical signal to produce an amplified optical signal in accordance with a gain control signal, and having a first detecting portion for detecting the input optical signal and a second detecting portion for detecting the amplified optical signal from the gain control portion;

controlling means responsive to detected signals from the first and second detecting portions for producing a source control signal related thereto; and



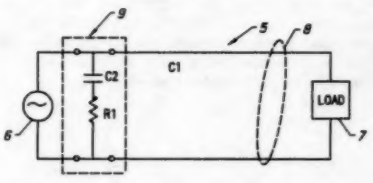
signal source means, coupled to the amplifying means, for generating the gain control signal corresponding to the source control signal.

4,954,787

AUDIO SIGNAL TRANSMISSION SYSTEM WITH NOISE SUPPRESSION NETWORK

Bruce A. Brisson, 3037 Grass Valley Hwy., Auburn, Calif. 95603

Filed May 18, 1989, Ser. No. 354,517
Int. Cl.[5] H03F 1/26
U.S. Cl. 330—149 **10 Claims**



1. An audio signal transmission system with an audible noise suppression circuit comprising:

amplifying means for amplifying audio signals, said amplifying means having a positive and a negative output terminal and a predetermined bandwidth;

an audio signal transmission cable having a first distributed capacitance, a positive input terminal coupled to said positive output terminal of said amplifier and a negative input terminal coupled to said negative output terminal of said amplifier;

means for providing a second capacitance which is coupled to said positive output terminal of said amplifier; and

means for providing a resistance which is coupled between said second capacitance providing means and said negative output terminal of said amplifier, the total of said first and said second capacitances having a value C and said resistance having a value R such that the reciprocal of the decay time t defined by the equation:

$$t=RC$$

comprises a frequency

$$f=1/t$$

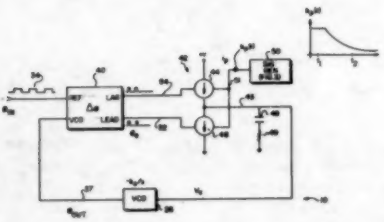
which is above the audio frequency spectrum and within said bandwidth of said amplifying means so as to prevent the generation of noise at audio frequencies in said system.

4,954,788

PHASE LOCKED LOOP WITH BANDWIDTH RAMP

Michael Leis, Framingham; Gary S. Engelson, Shrewsbury, and Bruce J. Lawrence, Worcester, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 193,337, May 12, 1988, abandoned.
This application Dec. 18, 1989, Ser. No. 453,356
Int. Cl.[5] H03L 7/00
U.S. Cl. 331—16 6 Claims



1. A phase locked loop arranged to receive an input signal having a preamble portion and a data portion, the phase locked loop comprising:

A. signal generating means, for providing a response control signal which monotonically decreases in amplitude beginning at a time when the phase locked loop receives the preamble portion and continuing to monotonically decrease during at least a portion of the time that the phase locked loop receives the data portion; and

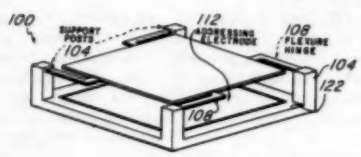
B. loop control means, coupled to the phase locked loop and the signal generating means, for adjusting the response time of the phase locked loop in accordance with the amplitude of the response control signal.

4,954,789

SPATIAL LIGHT MODULATOR

Jeffrey B. Sampsell, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1989, Ser. No. 413,924
Int. Cl.[5] G02B 26/08
U.S. Cl. 330—4.3 6 Claims



1. A spatial light modulator, comprising:

(a) a plurality of pixels;

(b) each of said pixels including

i. an electrostatically deflectable reflecting element over an addressing electrode, and

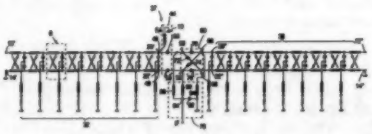
ii. a plurality of supports for said element, said supports constraining deflection of said element to positions parallel to an undeflected position.

4,954,790

ENHANCED COUPLED, EVEN MODE TERMINATED BALUNS, AND MIXERS AND MODULATORS CONSTRUCTED THEREFROM

Richard G. Barber, El Dorado Hills, Calif., assignor to Avantek, Inc., Milpitas, Calif.

Filed Nov. 15, 1989, Ser. No. 437,510
Int. Cl.[5] H03C 1/14; H04B 1/26; H03H 7/42
U.S. Cl. 332—164 25 Claims



1. A balun section comprising:

a circuit ground;

first and second input terminals;

first, second and third transmission lines;

first and second output terminals;

first and second capacitors; and

a resistor;

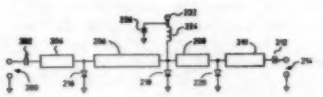
wherein the first and second capacitors are connected in series between the first and second output terminals and form a common node at the point that the first capacitor connects to the second capacitor, the third transmission line is connected in series with the resistor from the common node to the circuit ground, the first transmission line is connected between the first input terminal and the first output terminal, and the second transmission line is connected between the second input terminal and the second output terminal.

4,954,791

NON-COMMENSURATE LINE LENGTH RF MODULATOR

Mary K. Koenig, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1989, Ser. No. 414,946
Int. Cl.[5] H03C 1/62
U.S. Cl. 332—164 16 Claims



1. In a reflective shunt-diode RF modulator having an input, a first transmission line section, a second transmission line section and an output connected in series, said first transmission line section having a first electrical length and said second transmission line section having a second electrical length, a first shunt diode connecting said input to ground, a second shunt diode connecting a junction between said first transmission line section and said second transmission line section to ground and a third shunt diode connecting said output to ground and means to place said first, second and third diodes in a conducting state, the improvement wherein said first electrical length differs from said second electrical length.

4,954,792

MULTI-GRID ELECTRON TUBE HIGH FREQUENCY POWER OSCILLATOR

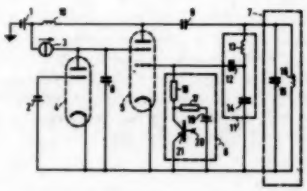
Christian S. A. E. Patron, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1989, Ser. No. 394,342

Claims priority, application Netherlands, Aug. 17, 1988, 8802035

Int. Cl.[5] H03B 1/02, 5/10

U.S. Cl. 331—169 7 Claims



1. A high-frequency power oscillator comprising; a multi-grid electron tube which includes at least a control grid, a screen grid and a cathode, a constant current source connected to the screen grid, a voltage-limiting circuit having one terminal connected to the screen grid and another terminal connected to the cathode of the electron tube, said voltage-limiting circuit having a low impedance for a voltage difference between the two said terminals above a preset threshold value and a high impedance for a voltage difference below said threshold value.

4,954,793

FILTER BANK

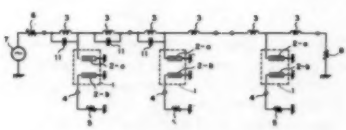
Koichiro Misu; Shusou Wadaka, and Tsutomu Nagatsuka, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,521

Claims priority, application Japan, Dec. 25, 1987, 327240

Int. Cl.[5] H03H 7/46, 9/76

U.S. Cl. 333—133 4 Claims



1. A filter bank, comprising:

a plurality of T-type circuits connected in cascade between a signal source and a terminal impedance, each T-type circuit including,

a surface acoustic wave (SAW) filter having a frequency pass band for passing power signals therethrough, and

a plurality of reactance elements connected in series forming a series element,

said SAW filter having an input side connected between two predetermined reactance elements of said series element and having an output side connected to an output terminal;

each SAW filter in said plurality of T-type circuits having a pass band of a different frequency for passing power signals from said signal source therethrough;

each T-type circuit having its series element connected to series elements of adjacent T-type circuits to form said plurality of T-type circuits connected in cascade between said signal source and said terminal impedance;

reactance elements of selected ones of said T-type circuits consisting of inductance elements and reactance elements of other T-type circuits consisting of a parallel connection of an inductance element and a capacitance element, to reduce transmission of spurious power signals through said SAW filters.

4,954,794

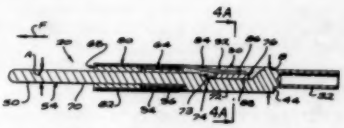
FILTER CONTACT

Gerald R. Nieman, Glendale; Clarence L. Clyatt, III, Phoenix; Eric J. Paulus; Scott A. Zehrung, both of Scottsdale; Albert Ragl, Mesa, all of Ariz., and John R. Moore, Tustin, Calif., assignors to ITT Corporation, New York, N.Y.

Filed Apr. 10, 1989, Ser. No. 335,413

Int. Cl.[5] H03H 7/00

U.S. Cl. 333—182 10 Claims



1. In a connector with a housing and a plurality of filter contact assemblies in the housing, the improvement wherein each contact assembly comprises:

a signal conductor with first and second ends, an inductor/resistor element coupled to said signal conductor, a ground conductor, a diode connected between the signal and ground conductors, a first capacitor connected between said signal and ground conductors, said diode having a predetermined capacitance, said diode and first capacitor connected to locations along said signal conductor which lie on opposite sides of said inductor/resistor element, and said capacitor having a capacitance substantially equal to the capacitance of said diode.

4,954,795

SURFACE ACOUSTIC WAVE FILTER FOR SUPPRESSING SURFACE TO SURFACE INTERFERENCE FOR A SATELLITE COMMUNICATION RECEIVER

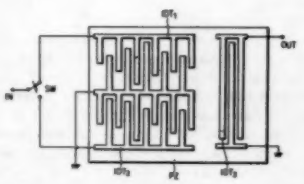
Young H. Choi, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Aug. 18, 1988, Ser. No. 234,141

Claims priority, application Rep. of Korea, Aug. 19, 1987, 1987-9050

Int. Cl.[5] H03H 9/64

U.S. Cl. 333—194 5 Claims



1. A filter for suppressing surface to surface interference in an IF band of a satellite communication receiver, comprising:

a substrate of piezoelectric material for propagating a surface acoustic wave;

a first input interdigital transducer, having a first frequency response, disposed on the substrate for passing said IF band and generating said surface acoustic wave in response to an input signal applied thereto;

a second input interdigital transducer, having a second frequency response, disposed on the substrate for suppressing an interference signal in said IF band and generating said

surface acoustic wave in response to said input signal applied thereto;

means for switching said input signal into either of said first and second input interdigital transducers; and

an output interdigital transducer receiving said surface acoustic wave in said substrate;

wherein said first and second input interdigital transducers are so configured that said first frequency response of said first input interdigital transducer has a predetermined band width, and said second frequency response of said second input interdigital transducer has said predetermined band width, while having a reduced gain in a predetermined frequency range within said band width for suppressing said interference signal,

wherein said first and second input interdigital transducers extend side by side along said substrate, and

wherein said first and second input interdigital transducers include a common electrode structure.

4,954,796

MULTIPLE RESONATOR DIELECTRIC FILTER

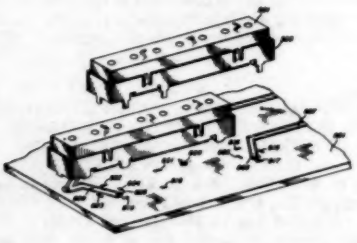
Steven R. Green, Glendale Heights; David M. De Muro, Cary; Michael F. Moutrie, Buffalo Grove, all of Ill.; Raymond L. Sokola, Albuquerque, N. Mex., and Phillip J. Gordon, Carmel, Ind., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 92,870, Sep. 3, 1987, Pat. No. 4,829,274, which is a division of Ser. No. 890,686, Jul. 25, 1986, Pat. No. 4,692,726. This application Aug. 10, 1988, Ser. No. 230,408

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[5] H01P *1/205*

U.S. Cl. 333—206 **10 Claims**



1. A duplex radio transceiver coupled to one antenna for both receive and transmit functions, comprising:

a transmitter;

a receiver;

a duplexer filter disposed between said transmitter and the antenna, and between said receiver and the antenna, said duplexer filter further comprising:

(a) at least two volumes of dielectric material, each volume of dielectric material having first, second, and side surfaces, said second and side surfaces of each volume of dielectric material being substantially covered with a conductive material;

(b) a plurality of holes extending through each said volume of dielectric material from said first surface to said second surface, the surface of at least two of said holes through each of said volume of dielectric material being substantially covered with a conductive material which is electrically common at said second surface of each respective volume of dielectric material, thereby forming at least two resonators in each said volume of dielectric material;

(c) first means for coupling a first of said at least two resonators of a first one of said at least two volumes of dielectric material to a first input/output terminal;

(d) second means for coupling a second of said at least two resonators of a first one of said at least two volumes of dielectric material to a second input/output terminal;

(e) third means for coupling a first of said at least two resonators of a second one of said at least two volumes of dielectric material to a third input/output terminal;

(f) fourth means for coupling a second of said at least two resonators of a second one of said at least two volumes of dielectric material to a fourth input/output terminal;

(g) mounting means comprising a conductive material for supporting at least one of said volumes of dielectric material on a substrate; and

(h) a first transmission line disposed on said substrate and coupling said first input/output terminal to said third input/output terminal and to the antenna whereby receiver signals from the antenna may be rejected by said first volume of dielectric material and transmitter signals from the transmitter may be rejected by said second volume of dielectric material.

4,954,797

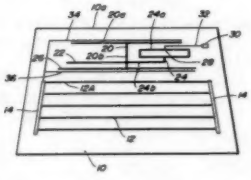
VEHICLE WINDOW GLASS ANTENNA COUPLED WITH DEFOGGING HEATER

Masao Shinnai; Kazuya Nishikawa; Tokio Tsukada, and Tohru Hirotsu, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Sep. 23, 1988, Ser. No. 248,093

Int. Cl.[5] H01Q *1/02, 1/32*

U.S. Cl. 343—704 **13 Claims**



1. A vehicle window glass antenna attached to a vehicle window glass which is provided with a plurality of heater strips extending horizontally, the antenna being located above the heater strips and comprising:

a first element which is a T-shaped conductive strip comprising a horizontal part and a vertical part extending from said horizontal part toward the heater strips;

a second element which is a conductive strip and extends horizontally from a point on said vertical part of said first element so as to exist only on one side of said vertical part;

a third element which is a conductive strip and comprises a primary part which constitutes at least three sides of a horizontally elongate rectangle on the other side of said vertical part of said first element and a secondary part which extends horizontally from a point on said vertical part and connects to said primary part;

a connecting line which extends from a point on said primary part of said third element to a feed point disposed on the window glass;

an auxiliary conductive line which connects with said heater strips and comprises a horizontal part which makes capacitive coupling with said horizontal part of said first element, and

another auxiliary conductive line connecting with said heater strips and including a horizontal part making capacitive coupling with at least one of said second element and said secondary part of said third element.

4,954,798

DEVICE FOR COUPLING REVERSIBLE ELECTROMAGNETIC CONTACTORS TO EACH OTHER WITH AN INTERLOCK UNIT

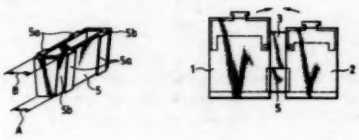
Mitsuharu Kasahara; Kuniyuki Kogawa, and Takato Hirota, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Aug. 18, 1988, Ser. No. 233,528

Claims priority, application Japan, Aug. 19, 1987, 62-126044[U]; Aug. 19, 1987, 62-126045[U]

Int. Cl.[5] H01H 9/20

U.S. Cl. 335—161 6 Claims



1. A device comprising:

an interlock unit;

first and second electromagnetic contactors, each electromagnetic contactor having a bottom side, a coupler side surface, and engagement grooves formed in the coupler side surface; and

a coupler integrally coupling said electromagnetic contactors to each other with the interlock unit sandwiched therebetween, the coupler having a front end, a rear end, a varying width, and first and second opposite side surfaces each having engagement portions inserted into the engagement grooves from the bottom sides of said electromagnetic contactors, wherein the width of said coupler at a portion thereof abutting on the coupler side surface of each of said electromagnetic contactors is larger at the rear end than at the front end thereof.

4,954,799

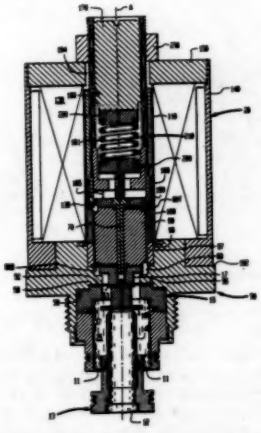
PROPORTIONAL ELECTROPNEUMATIC SOLENOID-CONTROLLED VALVE

Viraraghavan S. Kumar, Palm Bay, Fla., assignor to Puritan-Bennett Corporation, Overland Park, Kans.

Filed Jun. 2, 1989, Ser. No. 360,429

Int. Cl.[5] H01F 7/13; F16K 31/06

U.S. Cl. 335—236 18 Claims



1. A rectilinear motion proportional solenoid device comprising:

a housing containing an electromagnetic coil, said electromagnetic coil having a longitudinal axis and a bore coaxial therewith, for producing a magnetic field, said housing containing magnetic material for providing a flux path for said magnetic field;

a magnetic pole piece disposed within the bore of said electromagnetic coil;

a movable armature assembly of magnetic material;

suspension spring means within said bore of said electromagnetic coil for supporting said movable armature within said bore adjacent to one end of said magnetic pole piece for axial movement within said electromagnetic coil, so that an axial gap is formed between a first portion of said armature assembly and said magnetic pole piece and a radial gap is formed between a second portion of said armature assembly and a first portion of said housing; and

means for causing the force imparted to said movable armature by the application of a current to said electromagnetic coil to be substantially constant irrespective of the magnitude of said axial gap for a variation in said axial gap over a prescribed range.

4,954,800

MAGNET AND METHOD OF MANUFACTURING THE SAME

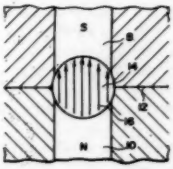
Naoji Ohtsuka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1987, Ser. No. 49,966

Claims priority, application Japan, May 20, 1986, 61-113583; Feb. 7, 1987, 62-25583; Feb. 7, 1987, 62-25584; Feb. 7, 1987, 62-25585

Int. Cl.[5] H01F 7/02

U.S. Cl. 335—284 4 Claims



1. A method for manufacturing a magnet having a plurality of pairs of magnetic poles comprising the steps of:

setting a molding apparatus for molding a resin material including magnetic powder into a predetermined shape, the molding apparatus having a cavity for pouring the resin therethrough and magnetic flux generating means for applying the magnetic flux to the resin material, the cavity being defined by a non-magnetic material and pairs of magnetic pole members, with each pair having a starting magnetic pole and a terminal magnetic pole and being made of ferromagnetic material, with the number of magnetic pole members being the same as the number of magnetic poles of the magnet, and the magnetic powder being oriented so that in the central portion of the molded article the magnetic powder is substantially parallel with a line connecting a starting magnetic pole and a terminal magnetic pole such that the magnetic powder in a peripheral portion of the molded article converges toward the central portion of a magnetic peak formed between the starting magnetic pole and the terminal magnetic pole;

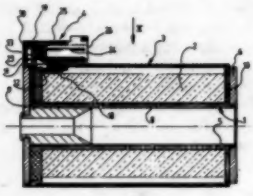
demagnetizing the molded product; and

magnetizing the molded product by a magnetizing apparatus having the same number of magnetizing poles as the magnetic poles of the magnet, the magnetic powder of the central portion of the molded product being magnetized in the same direction of the magnetic poles of the magnet.

4,954,801
ELECTRIC COIL AND IN PARTICULAR ELECTROMAGNET ARRANGEMENT COMPRISING A COIL SPOOL AND A COIL CASING

Patrick Urbanski, Saint Just en Chaussee, France, and Jo Smolders, Wespelaar, Belgium, assignors to Bristol Babcock S.A., Moay, France

Filed Dec. 11, 1989, Ser. No. 448,317
Claims priority, application France, Dec. 12, 1988, 88 16328
Int. Cl.[5] H01R *27/04*
U.S. Cl. 336—90 **5 Claims**



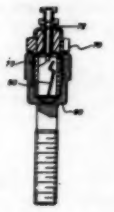
1. An electrical coil and in particular electromagnet arrangement of the type comprising a coil spool which includes a cylindrical coil-carrying body and at each end a flange, a sleeve-shaped coil casing enclosing said coil and a device for the outer electrical connection of the arrangement which comprises terminal connectors associated with one of said flanges and provided each one with a pin connected to the coil and with an outer connection pin, wherein the improvement consists in that the coil casing is coaxially positioned on the spool and is adapted to be positioned through axial fitting on the cylindrical body, in that the terminal connectors are anchored within the flange adjacent to the forward end of the casing by an anchoring lug portion extending into the flange from the periphery thereof, those portions which form the connecting pins are folded back so as to extend in parallel relation to the centre line axis of the arrangement from the plane of the anchoring flange in the direction of the other flange so that those portions which form the outer connection pin be located at a distance from the axis of the arrangement which is greater than that of the outer peripheral surface of the casing and in that the latter carries at its end adjacent to the anchoring flange a wall which extends at right angles to the axis of the arrangement and exhibits axial holes through which the outer folded back pins extend upon the fitting of the casing onto the cylindrical body.

4,954,802
BI-METAL TEMPERATURE SWITCH

Henry Wasserstrom, and Viorel Drambarean, both of Chicago, Ill., assignors to Stewart Warner Instrument Corporation, Chicago, Ill.

Filed May 19, 1989, Ser. No. 354,498
Int. Cl.[5] H01H *37/04, 37/52*
U.S. Cl. 337—380 **6 Claims**

1. A temperature switch assembly comprising:
a probe which is threaded at one end and has an indentation at the other end wherein the indentation is internally threaded and has a flat bottom surface;
a bimetal element having a flat surface and extension projecting away from the flat surface wherein the bimetal element is inserted into the indentation of the probe so that the flat surface of the bimetal element matches the bottom flat surface of the indentation;
a mating shell which screws into the indentation of the probe securing the bimetal element in the indentation, wherein the mating shell has a switch contact projecting into an open space created by the indentation of the probe and the mating shell, the switch contact being electrically insulated from the mating shell;

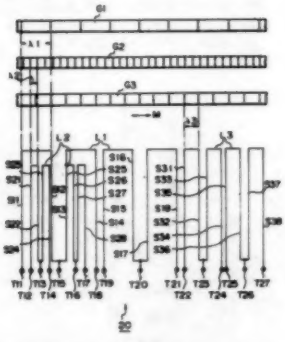


wherein the bimetal element deforms and makes contact with the switch contact when the temperature of the bimetal element reaches a predetermined value.

4,954,803
MAGNETIC-RESISTOR SENSOR AND A MAGNETIC ENCODER USING SUCH A SENSOR

Kenzaburou Iijima, and Yoshinori Hayashi, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Mar. 15, 1989, Ser. No. 324,391
Claims priority, application Japan, Mar. 18, 1988, 63-65379; Apr. 26, 1988, 63-102902
Int. Cl.[5] H01L *43/00*
U.S. Cl. 338—32 R **6 Claims**



1. An improved magnetic-resistor sensor, comprising:
a base; and
a plurality of juxtaposed comb-like patterns formed on said base plate;
each said comb-like pattern including a plurality of juxtaposed sensor sections spaced from each other by a distance fixed depending on the pitch of a respective magnetic information pattern stored on a magnetic scale, usable in combination with said resistor sensor and a plurality of connector portions intervening between said sensor sections; and
said distance being different from pattern to pattern.

4,954,804

ROTARY POTENTIOMETER

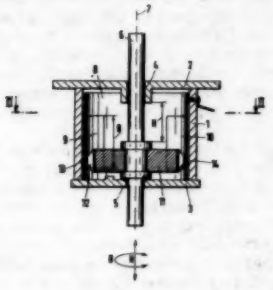
Gottfried Berthold, Reutlingen; Rudolf Limpert, Salz, and Friedhard Fehr, Lauter, all of Fed. Rep. of Germany, assignors to Preh-Werke GmbH & Co. KG, Saale, Fed. Rep. of Germany

Filed Mar. 3, 1989, Ser. No. 318,333

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807005

Int. Cl.[5] H01C *10/32*

U.S. Cl. 338—162 10 Claims



1. Rotary potentiometer comprising a cylindric or partially cylindric resistance track having two edges parallel to the axis of a cylinder corresponding to the resistance track which are provided with at least one first pair of electrodes applying voltage to the resistance track, and comprising a tap which engages the resistance track and which is fixed to an adjusting component rotatable around the cylinder axis, wherein the adjusting component is axially movable by a stroke axial to the cylinder axis relative to the resistance track, wherein the axial breadth of the resistance track is substantially equal to the stroke of the adjusting component, and wherein at the resistance track's two edges running in circumferential direction of the cylinder at least one second electrode pair is provided for mutually connecting with respective voltage sources.

4,954,805

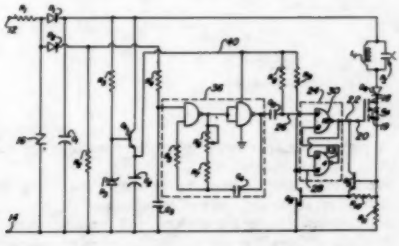
PIEZO ELECTRONIC HORN

William P. Buyak, New Hartford, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 6, 1990, Ser. No. 475,541

Int. Cl.[5] G08B *3/00*

U.S. Cl. 340—384 E 9 Claims



8. An electronic horn for alarm circuits of the type in which a d.c. power supply of particular polarity indicates an alarm condition, comprising:

a pair of power supply terminals connected to said d.c. power supply;

a piezo sounder connected across said supply terminals;

an inductor connected in parallel circuit with sai piezo sounder to form a tank circuit; and

current control means inserted in series circuit with said parallel circuit and said power supply terminals and operable during said alarm condition to

become periodically conductive so as to allow a current flow from said supply through said parallel circuit for a period corresponding to the period required to charge the capacitance of said sounder and to bring the current flow through said inductor to a predetermined value and to

become nonconductive so as to cut off said current flow when the current through said inductor reaches said predetermined value to allow said tank circuit to go into decaying oscillation at its natural frequency until the beginning of the next period when said control means again becomes conductive.

4,954,806

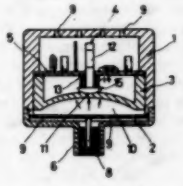
WARNING DEVICE FOR THE INADEQUATE TIRE AIR PRESSURE

Feng-Lin Hwang, No. 21, Pa Te Rd., Chi Tu District, Keelung City, Taiwan

Filed Jan. 17, 1990, Ser. No. 466,191

Int. Cl.[5] B60C *23/00*

U.S. Cl. 340—442 1 Claim



1. A warning device for the inadequate tire air pressure comprises:

an outer shell, which is a hollow barrel with one end of a threaded tube to screw to a tire's air valve and with the other end where a plurality of pores are provided, wherein an operating needle plate, a resilient hood, a switch bar and a PC board are placed in an order from the threaded tube toward the outer shell interior;

an operating needle plate, which is a circular sheet with a few small holes thereon and an operating needle at the center thereof extending perpendicular to the plate's plane, can push aside a tire's air stopper to allow air communication from the tire to an air chamber just in front of resilient hood when screwed to a tire valve;

a resilient hood, which has appropriate resilience and closely contacts the inner wall of said outer shell to e airtight, and has a concave means in the central part thereof for insertion by the tail part of switch bar;

a switch bar which is a screw bolt but has no thread and made by insulating material, and has a conductible portion in some suitable area of the bar body upper part to pass PC board's central opening where conductive circles are installed; the switch bar being placed on a concave means of resilient hood with its tail part securely connected thereto by means of a spring connection between the PC board and concave means;

a PC board, which is circular of shape and has an opening in the center thereof where conductive circles are installed for said switch bar to pass to contact or separate from them in switch control of the PC board circuit; with the above-described elements, this device if screwed to a tire valve is expected to send warning sounds and lights when the tire air pressure happens to reduce below the regulated standard.

4,954,807

COMBINATION INSTRUMENT FOR AUTOMOTIVE VEHICLES

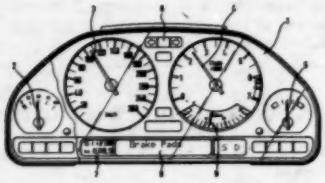
Helmut Fleischer, Niddatal; Ernst-Ulrich Simon, Oberursel, and Günter Schmitt, Kelkheim, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,988

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736761; Jan. 12, 1988, 3800572

Int. Cl.[5] B60Q *3/04*

U.S. Cl. 340—459 5 Claims



1. In a combination instrument for automotive vehicles in which different indicating instruments, indicating fields and control and warning lights are arranged in a common housing and covered by a common transparent glass, the improvement wherein the instrument further comprises

an inner housing, a display computer, and a circuit board, the computer being disposed on the circuit board within the inner housing, the inner housing being substantially impervious to high frequencies, the inner housing being located within said common housing;

a lower part of a multiple-plug-type connector fastened on at least one outer surface of said inner housing;

electrical contacts which are formed by elongated conductors which extend in one piece from said circuit board through a wall of said inner housing into said plug-type connector; and

a ferrite core disposed in said inner housing; and wherein

the elongated conductors are led at least once through the ferrite core.

4,954,808

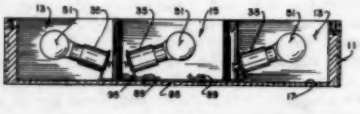
EYE LEVEL REAR MOUNTED LIGHTED TURN AND STOP SIGNAL FOR VEHICLES

Manfred F. Duerkob, Franklin, Mo., assignor to Dorothy I. Duerkob, Pacific, Mo.

Filed Aug. 7, 1989, Ser. No. 390,197

Int. Cl.[5] B60Q *1/38*

U.S. Cl. 340—475 13 Claims



1. A lighted turn and stop signal unit for rear mounted, eye level use on an inside rear shelf of an automobile, comprising in combination:

an elongated housing having spaced end compartments and an intermediate compartment each having one open side on the same side thereof and serving together as the rear side of said unit when mounted on the inside rear shelf of an automobile,

a light in each of the compartments which is shielded from the other compartments and visible from each open side, the lights in said end compartments being electrically connected to automobile left and right turn signal indicators, and the light in the intermediate compartment being electrically connected to the automobile brake pedal;

a plurality of light support brackets for supporting the lights; at least one of said light support brackets extending between two of the compartments and supporting the lights in both of the compartments;

light shields between said compartments and being operatively associated with said light support brackets to shield the light between said compartments;

colored lenses for the open side of each said compartment;

an elongated material strip extending across the open sides of said compartments and being operatively associated with said colored lenses, said elongated material strip including arrow-shaped left-turn and right-turn openings for the end compartments of said housing and an elongated intermediate opening for the intermediate compartment;

a cover secured to said housing which overlies and captures the elongated material strip and the colored lenses between said cover and said housing; and

said elongated material strip including peripheral marginal areas serving as a gasket for engagement by both said cover and said housing when secured together,

whereby when either said left or right turn indicators and/or the brake pedal is engaged, the lights in said compartments will project a light beam through the arrow-shaped left-turn or right-turn openings or the elongated intermediate opening of the elongated material strip to provide early advanced warning to following vehicles of turning or stopping by the automobile containing said unit.

4,954,809

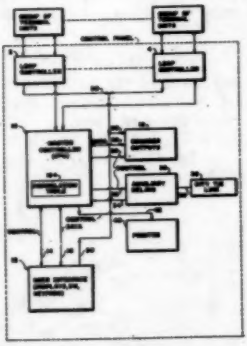
CONTINUITY-ISOLATION TESTING FOR CLASS A WIRING IN FIRE ALARM SYSTEM

Robert W. Right, Huntington, Conn., and Simon T. Carter, Brighton, England, assignors to General Signal Corporation, Stamford, Conn.

Filed May 1, 1989, Ser. No. 345,596

Int. Cl.[5] G08B *29/00*

U.S. Cl. 340—516 4 Claims



1. Apparatus for continuity-isolation testing in a fire alarm system or the like, comprising:

a transmission loop defined by two lines extending from respective, separated pairs of terminals;

a loop controller including both pairs of terminals such that said loop defines first and second channels by which said controller can communicate with said loop;

a plurality of terminal units connected to said transmission loop; each of said terminal units having comparison means for determining whether a received address signal coincides with an identification address stored in the terminal unit, said comparison means producing an output signal responsive to coincidence;

said loop controller being connected to the transmission loop and including means for transmitting a plurality of address signals cyclically to said terminal units;

said loop controller further including means for systematically sending out isolation test signals, in the form of an address code, on the respective, separated pairs of terminals defining said first and second channels, for alternate bi-directional transmission on said transmission loop;

means in said loop controller for entering data to the effect that particular devices on said transmission loop but reporting back are isolated from said first channel, and that particular devices on said same transmission loop not reporting back are isolated from said second channel; and

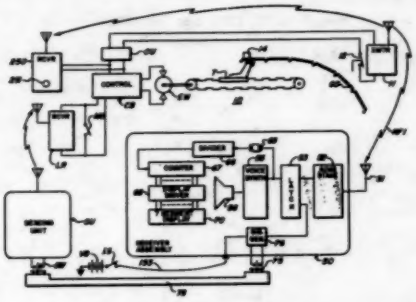
means for comparing said data from said first and second channels, whereby all the non-reporting devices can be ascertained and a plurality of discontinuities on the same transmission loop can be resolved.

4,954,810

GARAGE DOOR OPENERS

Theodore E. Llewellyn, 212 River Oaks, Bakersfield, Calif. 93309

Filed Jan. 22, 1990, Ser. No. 468,057
Int. Cl.[5] G08B *13/08, 25/02*
U.S. Cl. 340—545 **6 Claims**



1. In an automated door operating system characterized by a source of motive power connected to operate said door, a control system for controlling said source of motive power and a remote sending unit conformed to issue signals to said control system for directing the operation of said door, the improvement comprising:

a radio frequency transmitter deployed adjacent said door and rendered operative to produce a first radio signal upon the opening of said door; and

a first radio frequency receiver attached to said sending unit and including a clock rendered operative in response to the receipt of said first radio signal, an audio signal source concurrently actuated with said clock, and signaling means concurrently actuated with said sending unit for terminating the operation of said clock upon the actuation thereof.

4,954,811

PENETRATION SENSOR

Joseph V. Chatigny, Wayne, Pa., and Peter R. Smith, Folsom, Calif., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 29, 1988, Ser. No. 277,373
Int. Cl.[5] G08B *13/00*
U.S. Cl. 340—550 **29 Claims**

1. A penetration sensor, comprising:

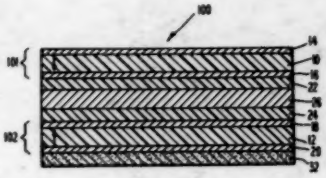
a first transducer having both piezoelectric and pyroelectric activities;

a first dielectric layer disposed adjacent to said first transducer;

a second transducer having both piezoelectric and pyroelectric activities;

a second dielectric layer disposed adjacent to said second transducer;

isolation means disposed between said first and second dielectric layers for capacitively isolating said first and second transducers;



said first and second transducers arranged to form a stacked assembly with said first and second dielectric layers and said isolation means disposed therebetween; and

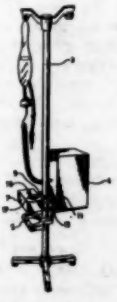
means for mounting one of said transducers in thermal contact with an area through which penetration is to be sensed.

4,954,812

MAGNETIC FIELD ALARM INDICATOR

Fernando C. Lebron, London, Canada, assignor to London Health Association, Ontario, Canada

Filed May 1, 1989, Ser. No. 345,877
Claims priority, application Canada, Oct. 25, 1988, 581126
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—551 **13 Claims**



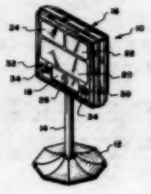
1. A magnetic field alarm indicator, comprising means for detecting the magnitude of a magnetic field within a 360-degree field of view and in response generating an output signal proportional to said magnitude, said means for detecting comprises a plurality of magnetic field detectors mounted in the same plane for detecting respective rotational components of said field and in response generating respective signals proportional thereto, each of said detectors being oriented at a predetermined angle with respect to adjacent ones of said detectors thereby encompassing said 360-degree field of view, and means for comparing said output signal to a predetermined set-point signal and in the event said output signal is greater than said set-pint signal generating an alarm signal.

4,954,813

PORTABLE WARNING DEVICE

Alfred A. August, Sr., Concord, and Anthony M. Jackson, San Jose, both of Calif., assignors to Safety by Design, Inc., Santa Clara, Calif.

Filed Aug. 9, 1989, Ser. No. 391,086
Int. Cl.[5] G08B 13/14
U.S. Cl. 340—571 5 Claims



1. A portable warning device comprising:

a stanchion having an upper end and a lower end, said lower end adapted to be located on a supportive surface, said upper end being spaced from the supportive surface, said stanchion having a plurality of side walls each, said side wall being planar with the arrangement of said side walls being polygonal;

light means located at said upper end, said light means being readily visually observable by a human being when coming into close proximity with said stanchion;

antitheft alarm means connected to said stanchion, said antitheft alarm means to activate an annunciator upon said stanchion being moved from its established location;

human voice recording means connected to said stanchion, said recording means being activatable to record a particular message;

sensor means connected to said stanchion, said sensor means being activated upon a human being moving within a certain distance of said stanchion, said sensor means being wireless and detecting heat of the human being, said sensor means comprising a pair of sensor, switch means associated with said stanchion, said switch means for selecting either one said sensor or both said sensors, one said sensor being mounted within one said side wall, the remaining said sensor being mounted within another said side wall, said sensors functioning to be sensitive to the entire three hundred sixty degree arear directly about said stachion; and

sound reproduction means connected to said stanchion, said message being reproduced and transmitted upon activation of said sensor means.

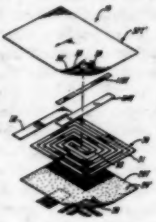
4,954,814

TAG AND METHOD OF MAKING SAME

S. Eugene Benge, Middletown, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 269,504, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 114,792, Oct. 28, 1987, Pat. No. 4,818,312. This application Sep. 11, 1989, Ser. No. 405,596
Int. Cl.[5] G08B 13/24
U.S. Cl. 340—572 16 Claims

1. Method of making tags for use in an electronic article surveillance system, comprising the steps of: providing a detectable resonant circuit, forming a deactivator for deactivating the resonant circuit, wherein the forming step includes providing a composite strip having a conductive layer, a normally non-conductive layer adhered to the conductive layer and a coating surrounding the adhered layers, and positioning the composite strip in proximity to the resonant circuit so that when excess energy is applied to the deactivator the normally non-conductive layer becomes conductive and the coating is



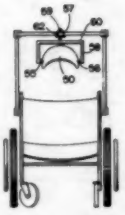
rendered ineffective whereby the resonant circuit is deactivated.

4,954,815

HEAD POSITIONING SYSTEM

Jeffrey C. Delmonte, 553 Second St., Hermosa Beach, Calif. 90254

Filed Jun. 17, 1988, Ser. No. 208,368
Int. Cl.[5] G08B 21/00
U.S. Cl. 340—686 12 Claims



1. A head positioning system for physically impaired persons including positioning means having x, y and z axes for placing the head in a controlled position which provides support for the head including means for preventing uncontrolled motion transitional of the head with respect to said system along the x axis and along the y and z axes after adjustment along the y and z axes,

x axis pivot means connected to said positioning means for allowing enhanced, free flowing, non-resistive motion about said x axis.

4,954,816

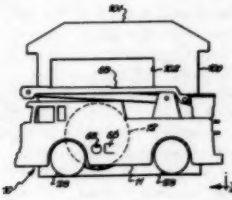
DECORATIVE SMOKE DETECTOR CONSTRUCTION

Lawrence A. Mattison, 388 N. Ellicott Creek Rd., Tonawanda, N.Y. 14150

Filed Feb. 16, 1989, Ser. No. 311,704
Int. Cl.[5] G08B 23/00
U.S. Cl. 340—693 36 Claims

29. A decorative smoke detector construction for mounting relative to a room surface comprising a first decorative plaque for mounting proximate a room surface, a second decorative plaque spaced from said first decorative plaque in a direction away from said room surface, a smoke detector including a smoke detector housing, and means mounting said smoke detector housing relative to said first and second decorative

plaques and behind said second decorative plaque, said first and second decorative plaques extending laterally outwardly



beyond said smoke detector housing in a direction lengthwise of said room surface.

4,954,817

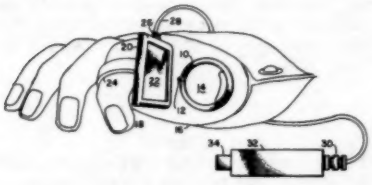
FINGER WORN GRAPHIC INTERFACE DEVICE

Neil A. Levine, 841 Oeste Dr., Davis, Calif. 95616

Filed May 2, 1988, Ser. No. 189,185

Int. Cl.[5] G09G *3/09*

U.S. Cl. 340—706 **19 Claims**



16. A method for information transfer to a receiver the steps including:

wearing a digitizing means on one finger,

wearing a stylus means on another finger,

coupling the digitizing means to a receiver,

and activating said digitizing means with said stylus means, thereby effectuating locational information transferred to the receiver.

4,954,818

MULTI-WINDOW DISPLAY CONTROL SYSTEM

Kelichi Nakane; Tadashi Kuwabara; Naoya Ikeda; Hiroyuki Koreeda; Hiroaki Aotsu, all of Yokohama; Masaki Kawase, Katsuta; Yujiro Tatsuno, Hitachi; Naomichi Nonaka, and Kazunari Suzuki, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Microsoftware Systems, Inc., Yokohama, both of, Japan

Filed Oct. 20, 1986, Ser. No. 920,425

Claims priority, application Japan, Oct. 18, 1985, 60-231191; May 19, 1986, 61-112632; Sep. 19, 1986, 61-219633

Int. Cl.[5] G06F *3/14*

U.S. Cl. 340—721 **15 Claims**

1. A multi-window display control system which is composed of a central processing unit, a main memory, a shared memory, an external memory, an input means, a display means and a display memory for storing a plurality of display data being overlapped and displayed, said system comprising:

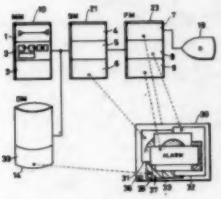
a display processing means for performing display processing of a plurality of display data;

a first save area installed on the display memory for temporarily saving overlapped data of the plurality of display data;

a second save area installed on the shared memory for temporarily saving overlapped data of the display data;

a third save area installed on the external memory for temporarily saving overlapped data of the plurality of display data;

a first control table installed on the main memory for controlling display position, mutual priority for display, and a save area during overlap, regarding each of a plurality of display data stored in the display memory,



wherein said display processing means controls display of the plurality of display data using the first control table, the first, second and third save areas, and the display memory.

4,954,819

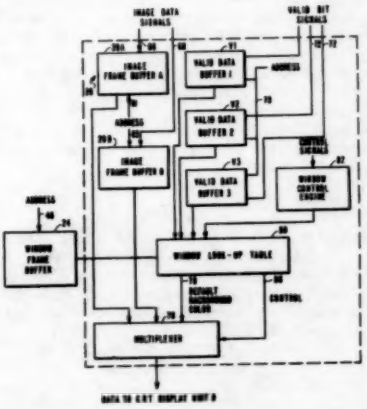
COMPUTER GRAPHICS WINDOWING SYSTEM FOR THE DISPLAY OF MULTIPLE DYNAMIC IMAGES

Gary S. Watkins, Salt Lake City, Utah, assignor to Evans & Sutherland Computer Corp., Salt Lake City, Utah

Continuation of Ser. No. 68,287, Jun. 29, 1987, abandoned, which is a continuation of Ser. No. 734,923, May 16, 1985, abandoned. This application Oct. 11, 1988, Ser. No. 256,335

Int. Cl.[5] G09G *1/28*

U.S. Cl. 340—721 **13 Claims**



1. A dynamic window control system for use with a computer graphics apparatus, providing image data and control signals for a scan-pattern display, comprising:

an image frame buffer means for storing pixel area image data for said scan-pattern display;

a window frame buffer for defining a plurality of windows of said display;

a plurality of valid data buffers, each for storing a binary validity signal to designate select data pixels as stored in said image frame buffer; and

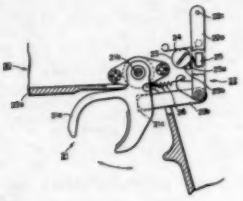
means for supplying image data from said image frame buffer to said scan-pattern display in the sequence of said scan-pattern selectively under control of said window frame buffer and one of said valid data buffers.

4,954,820

TRANSMITTER FOR RADIO CONTROL SYSTEM

Naoichi Kohne; Masahiro Arai; Akira Aneha, and Michio Fujisaki, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Mar. 23, 1989, Ser. No. 327,611
Claims priority, application Japan, Mar. 24, 1988, 63-039447
Int. Cl.[5] H04B 7/00
U.S. Cl. 340—825.69 7 Claims



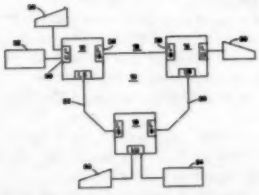
1. A transmitter for a radio control system comprising:
a plurality of main control elements which are controllable in directions relative to each other about a neutral point and control basic operation of a controlled unit;
an auxiliary control element for selecting control characteristics of said main control elements;
control of said main control elements and auxiliary control element causing a radio wave to be output from said transmitter and then received as an input signal by a receiver loaded on said controlled unit, resulting in an actuation section being actuated depending on said input signal to carry out remote control of said controlled unit;
a first changeover element for changing over a mechanically neutral of said main control elements; and
a second changeover element operated when specific control characteristics of said main control elements are selected by said auxiliary control element, resulting in setting an electrically neutral point of said actuation section depending on the mechanically neutral point of said main control elements;
operation of said first changeover element causing said second changeover element to be changed over in association therewith.

4,954,821

METHOD OF ESTABLISHING TRANSMISSION GROUP NUMBERS FOR NETWORK LINKS

James P. Gray, Chapel Hill; Jeffrey G. Knauth, Raleigh; Diane P. Pozefsky, Chapel Hill, and Lee M. Rafalow, Durham, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1988, Ser. No. 168,286
Int. Cl.[5] H04Q 1/00
U.S. Cl. 340—825.52 5 Claims



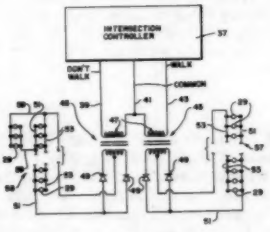
1. In a communications network wherein selected pairs of nodes may be selectively, directly connected by transmission groups, each transmission group being uniquely identified as a function of the names of the paired nodes in combination with an assigned transmission group number, a method for allowing one of the nodes to assign the transmission group number, said method being performed at each of the two nodes during initialization of the connection and comprising the steps of:
sending an exchange identification message from a first node to a second node, said message including a proposed non-zero transmission group number if one had been previously determined at the first node or a zero transmission group number if no non-zero transmission group number had been previously determined;
determining at the first node the value of the transmission group number contained in an exchange identification message received from the second node;
setting the final transmission group number equal to the proposed non-zero transmission group number sent by one of the first and second nodes where the other of the nodes originally sent a zero transmission group number;
comparing the relative significance of the first and second node names according to predetermined criteria where both nodes send either zero transmission group numbers or proposed non-zero transmission group numbers;
selecting the node having the more significant node name according to the predetermined criteria;
causing the selected node to assign a final non-zero transmission group number where both nodes originally sent zero transmission group numbers or where both nodes originally sent proposed non-zero transmission group numbers.

4,954,822

TRAFFIC SIGNAL USING LIGHT-EMITTING DIODES

Arnold Borenstein, 2818 W. Chase, Chicago, Ill. 60645

Filed Sep. 2, 1988, Ser. No. 240,072
Int. Cl.[5] G08G 1/07
U.S. Cl. 340—925 26 Claims



23. A street traffic signal device for providing a high resolution signal to vehicular and pedestrian traffic comprising:
a display support structure including a non-reflective panel member which is substantially flat;
a set of signal elements supported on said panel in a configuration corresponding to a traffic control symbol;
each of the signal elements comprising a high intensity light emitting diode element having an angle of dispersion about a central axis which is substantially perpendicular to said panel member, each diode in the set being connected in electrical parallel with every other diode in the set; and
power supply means for supplying electrical power being connected with said light emitting diode elements, and light emitting diode elements generating light responsive to power being applied thereto, whereby the traffic control symbol formed by illuminated diodes is only perceived by traffic when the diodes are illuminated.

4,954,823

TOUCH KEYBOARD SYSTEMS

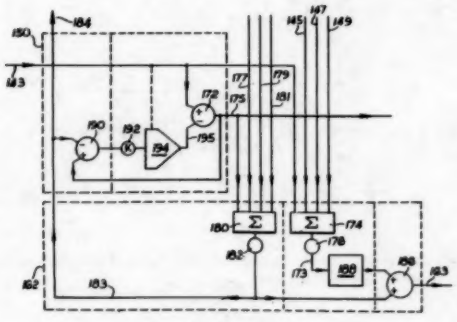
Ronald P. Binstead, 15 Seely Road, Radford, Nottingham, England

Continuation-of Ser. No. 160,707, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 21,639, Mar. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 828,326, Jan. 28, 1986, abandoned. This application Mar. 9, 1989, Ser. No. 323,251

Claims priority, application PCT Int'l Appl., Apr. 16, 1985, PCT/GB85/00168

Int. Cl.[5] G06F *3/14*

U.S. Cl. 341—26 19 Claims



1. A touch operated key apparatus including a sheet of glass, a keyboard comprising a plurality of keypads, means for attaching the keyboard to the sheet of glass to operate the keypads through the sheet of glass, means for displaying data and for controlling processes selectable by the keyboard, said apparatus further including processing circuitry for processing signals from the keypads of the keyboard and interrogation means for interrogating the output signals from at least one of the keypads, sensing means associated with the keyboard for detecting and for processing the outputs of the at least one of the keypads, said sensing means including a plurality of signal processing circuits for receiving a respective signal from a respective keypad, a long term drift compensation circuit connected to receive respective signals from several of the keypads for generating a drift compensation signal value and a store for storing the drift compensation signal value, comparison means for comparing the output of the respective signal processing circuits of the keypad being interrogated with the output of said signal processing circuit of at least one other keypad and with the stored drift compensation signal to determine as a result of the comparisons whether the keypad being interrogated has been touched, average change generation means for continually generating an average change signal representative of the average of the last changes in at least two of the keypads, an intergration circuit for generating a summation of previous average change signals, each of said signal processing circuits including an average signal comparator for comparing the output signal from a respective keypad with the summation signal generated by said integration circuit, means for modifying the output signal of said respective signal processing circuits by the output signal of said average signal comparator in proportion to the difference between the change in output signal for the respective keypad and the average change for all of the interrogated keypads, said comparison means being operative for comparing the differences between the change in output signal for each respective keypad and the average change for all interrogated keypads instead of the absolute value of the output of each respective keypad.

4,954,824

SAMPLE RATE CONVERSION SYSTEM HAVING INTERPOLATION FUNCTION WITH PHASE LOCKED CLOCK

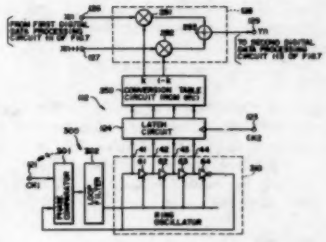
Masahiro Yamada, Kawasaki, and Kiyoyuki Kawai, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 15, 1988, Ser. No. 244,295

Claims priority, application Japan, Sep. 18, 1987, 62-233947

Int. Cl.[5] H03M *7/00*

U.S. Cl. 341—61 17 Claims



1. A sample rate conversion circuit for converting first digital data processed by a first clock signal having a first frequency into digital data processed by a second clock signal having a second frequency, comprising:

ring oscillator means, having a predetermined number of voltage-controlled gate delay elements connected to each other in the form of a loop, for outputting polyphase delay clock signals and a predetermined self-excited oscillation signal;

phase-locking means for applying a control voltage corresponding to a phase difference between the first clock signal and the self-excited oscillation signal to each of said voltage-controlled gate delay elements so as to phase-lock the first clock signal with the self-excited oscillation signal output from said ring oscillator means;

latch means for latching the polyphase delay clock signals output from said ring oscillator means in accordance with the second clock signal;

interpolation coefficient generating means for generating an interpolation coefficient corresponding to phase data between the first and second clock signals in accordance with the polyphase delay clock signals latched by said latch means; and

interpolating means for interpolating two adjacent data of the first digital data by using the interpolation coefficient generated by said interpolation coefficient generating means and outputting the interpolated data as the second digital data.

4,954,825

SELF CLOCKING BINARY DATA ENCODING/DECODING METHOD

Chao S. Chi, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.J.

Filed Mar. 22, 1989, Ser. No. 327,073

Int. Cl.[5] H03M *5/06*

U.S. Cl. 341—64 14 Claims

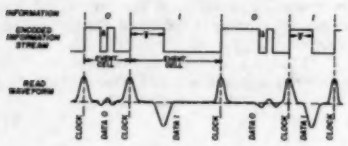
1. A method for modulating binary data comprising first and second information, the method comprising:

(a) defining within a medium an event-cell as the time between two adjacent clock transitions, the clock transitions each having a similar, unique characteristic; and

(b) selectively writing to the medium the information within the event-cell at an arbitrary time, by

(i) generating a first transitional event and a corresponding first read signal, in response to the first information; or

(ii) generating a second transitional event and a corresponding second read signal, in response to the second information; and



(c) wherein said first transitional event and said second transitional event differ in the number of transitions per event-cell.

4,954,826

DIGITAL CODE CONVERSION APPARATUS

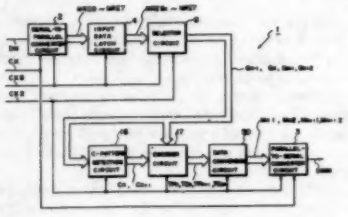
Masaaki Isozaki, and Kazuhiro Takano, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,368

Claims priority, application Japan, Dec. 27, 1986, 61-311604; Feb. 17, 1987, 62-033897

Int. Cl.[5] H03M *9/00*

U.S. Cl. 341—100 **14 Claims**



1. A digital code conversion apparatus comprising:

serial-to-parallel converter means for receiving input data formed of serial data and for converting said input data at a first clock rate into parallel data which are shifted one after another by a first number of bits to thereby output parallel data in which a plurality of the parallel data output at the preceding and the following clock periods have a second number of bits of overlapped data;

code conversion means for detecting said second number of bits of overlapped data of said plurality of parallel data and converting said plurality of parallel data into a plurality of converted data in a conversion rule; and

parallel-to-serial conversion circuit means for converting said plurality of converted data obtained through said code conversion means into serial converted data.

4,954,827

ANALOG DIGITAL CASCADE CONVERTER

Pham N. Tung, Paris, France, assignor to Thomson Hybrides et Microondes, Paris, France

Filed Nov. 9, 1988, Ser. No. 269,011

Claims priority, application France, Nov. 10, 1987, 87 15535

Int. Cl.[5] H03M *1/36*

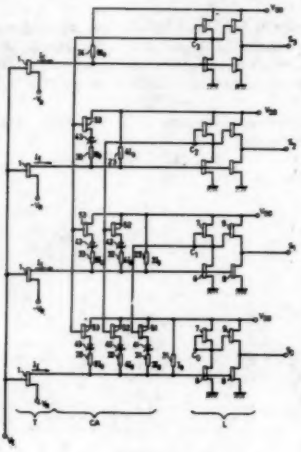
U.S. Cl. 341—159 **9 Claims**

1. An analog-digital converter converting an input analog signal into an output digital signal formed by several bits, wherein the input signal is addressed in parallel to one and the same set of several bit level circuits connected with one another in cascade, each level being formed by:

a transducer stage which converts the input voltage into a current which is proportionate to it,

an analog comparator stage which compares said current with a calibrated current given by several elementary current sources,

a logic circuit stage, a first output of which gives a control signal applied to the elementary current sources of the less



significant bit levels, and a second output which delivers a bit of the digital signal.

4,954,828

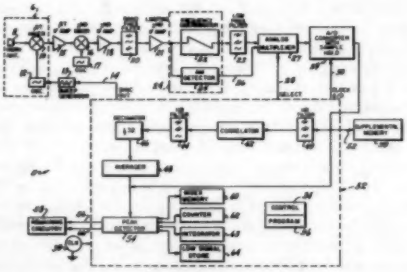
LONG RANGE POLICE RADAR WARNING RECEIVER

Steven K. Orr, Loveland, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 421,525, Oct. 13, 1989. This application Feb. 20, 1990, Ser. No. 481,509

Int. Cl.[5] G01S *7/40*; H04B *17/00*

U.S. Cl. 342—20 **20 Claims**



1. A police radar warning receiver comprising:

IF signal means for producing an IF sweep pattern as an oscillator signal is swept in frequency between a first frequency and a second frequency in response to mixing of received RF signals in at least one band of police radar signal frequencies with said swept oscillator signal;

FM discriminator means responsive to said IF signal means for producing an FM sweep pattern corresponding to FM demodulation of said IF sweep pattern as said IF sweep pattern is produced;

sampler means for repeatedly sampling at sample intervals said FM sweep pattern as it is produced whereby to produce a series of digital sample words each associated with a respective sample interval;

correlator means for correlating each digital sample word as it is produced with a plurality of proceeding said digital sample words and a complex correlator function whereby

to provide a series of complex digital correlator words each associated with a respective sample interval;

averager means for accumulating for each of at least a plurality of said sample intervals, an average of the complex digital correlator word produced each sweep and associated with a said sample interval over a plurality of sweeps of the oscillator signal whereby to produce a series of averager words each associated with a respective one of said plurality of sample intervals;

substitution means for replacing in said series of averager words an averager word associated with a selected sample interval with a substitute averager word corresponding to the correlator word from that sample interval;

threshold means for providing after a given sweep of the oscillator signal a dynamic threshold word corresponding to the magnitude of said series of averager words; and

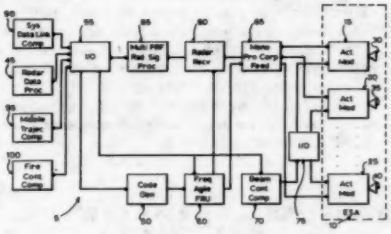
peak detector means for providing an alarm enable after said given sweep if an averager word has a magnitude greater than said dynamic threshold word whereby to indicate receipt of a police radar signal.

4,954,829

DATA LINK USING ELECTRONICALLY STEERABLE BEAM

William H. Fiden, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 28, 1989, Ser. No. 329,459
Int. Cl.[5] G01S *13/86*
U.S. Cl. 342—60 **28 Claims**



1. A missile data link comprising:

radar transmitter means mounted in a first vehicle for providing a radar signal;

data transmitter means mounted in said first vehicle for providing a first radar data signal;

array antenna means mounted in said first vehicle for electronically steering an output beam containing said radar signal and said first radar data signal;

radiating element means mounted on said first vehicle for receiving a second radar data signal;

data receiving means mounted in a second vehicle for receiving said output beam and processing said radar data signal; and

monopulse processor means mounted in said first vehicle for collecting said second radar data signal received by said radiating element means.

4,954,830

RANGE RESOLVING METHOD

Kapriel V. Krikorian; Robert A. Rosen, both of Los Angeles, and Frank K. Li, Rancho Palos Verdes, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

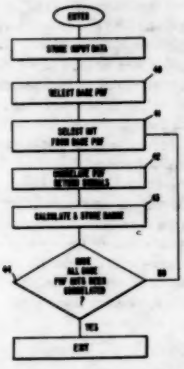
Filed Sep. 14, 1979, Ser. No. 74,578
Int. Cl.[5] G01S *13/12*
U.S. Cl. 342—137 **17 Claims**

1. A method of determining the range of a target for use in a radar system employing multiple pulse repetition frequencies (PRFs) and providing digitized signals indicative of target return signals from a plurality of range intervals, said method comprising the steps of:

(1) selecting one of said PRFs as a base PRF;

(2) selecting a second PRF and extending its number of range intervals by an amount equal to the difference in range intervals between said base and second PRFs times the number of PRF ambiguities that corresponds to the maximum target detection range;

(3) selecting a range interval having a digitized target return signal therein from the signals associated with said base PRF;



(4) correlating the range intervals associated with the second PRF by selecting range intervals of said remaining PRFs, based upon the differences between the number of range intervals in any particular PRF and that of the base PRF, to determine if target signals are present therein which satisfy a first predetermined relationship therebetween;

(5) calculating the range of the target, based on a second predetermined relationship and the information obtained in steps 1, 2, 3 and 4 above; and

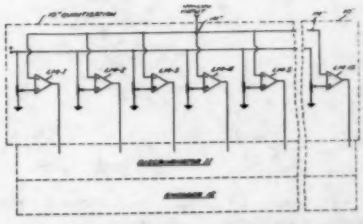
(6) repeating steps 4 and 5 for each of the remaining range intervals of said base PRF having digitized target return signals therein.

4,954,831

ANALOG-TO-DIGITAL CONVERTER

Robin K. Ekins, Elkins; Robin K., Fort Lauderdale, Fla. 33312

Continuation of Ser. No. 875,550, Jun. 18, 1986, abandoned.
This application Dec. 13, 1988, Ser. No. 284,798
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—159 **28 Claims**



1. An analog-to-digital converter which does not require a clock and which requires the three following stages, namely:

(a) A separate, discrete, quantization stage including an analog signal input terminal,

a plurality of output terminals corresponding individually to different analog input signal magnitudes on said input terminal,

and means connected between said input terminals and said output terminals for producing a first binary logic state on only those output terminals which correspond to signal magnitudes not greater than the instantaneous analog input signal magnitude and for producing the opposite binary logic signal state on all the other output terminals of the quantization stage;

(b) A separate, discrete, discriminator stage having a plurality of output terminals,

means connected between the output terminals of the quantization stage and the output terminals of the discriminator stage for producing an output signal of one binary logic state on the output terminal of the discriminator stage which corresponds to a particular magnitude range of the analog input signal on said analog signal input terminal of the quantization stage and for producing output signals of the opposite binary logic stage on all the other output terminals of the discriminator stage; and means for providing several digital data output terminals; and

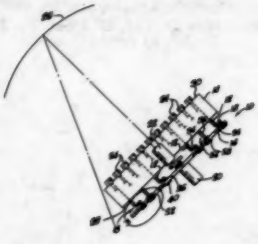
(c) a separate, discrete, encoder stage operatively connected between said output terminals of the discriminator stage and said digital data output terminals to provide different possible combinations of binary logic states on said digital data output terminals, depending upon which one of said output terminals of the discriminator stage has the output signal of said one binary logic state.

4,954,832

APPARATUS FOR SIMULTANEOUSLY ROTATING A PLURALITY OF PARALLEL SHAFTS

Richard W. Grant, Manhattan Beach, and Allen G. Storaasli, Hermosa Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 23, 1985, Ser. No. 693,954
Int. Cl.[5] F16H *33/00*
U.S. Cl. 342—352 **10 Claims**



1. An apparatus for simultaneously rotating a plurality of substantially parallel shafts, comprising:

a substrate to which said shafts are rotatably connected;

a drive plate;

means for coupling the plate to the shafts;

a first motor secured to the plate; and

a second motor secured to the substrate and drivingly coupled to the first motor, such that actuation of either motor orbits the plate in the prescribed fashion.

4,954,833

METHOD FOR DETERMINING ASTRONOMIC AZIMUTH

Alan G. Evans, LaPlata, Md., and William L. Stein, Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1989, Ser. No. 376,278
Int. Cl.[5] G01S *5/02*
U.S. Cl. 342—357 **7 Claims**

1. A method for determining astronomic azimuth between a fixed site and a target comprising the steps of:

(a) determining geodetic azimuth, α, from the fixed site where geodetic azimuth is defined as the angle from true north (mean polar axis of the earth) to the target in a plane normal to an ellipsoidal model of the gravity vector;

(b) determining at the fixed site a gravity deflection of the vertical, comprising η the east component and ξ the north component which when combined is the angular difference between an actual gravity vector direction and the ellipsoidal model gravity vector direction; and

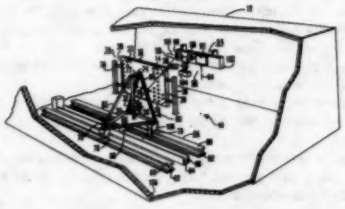
(c) calculating astronomic azimuth, A, defined as the angle from true north to the target in a plane normal to the actual gravity vector, from geodetic azimuth using relationships derived from gravity vertical deflections: $A\alpha+\eta \tan\phi+(\xi \sin\alpha-\eta\cos\alpha)\cot z$ where ϕ=geodetic latitude at the fixed site z=geodetic zenith distance (generally, $z \approx 90°$ and $\cot z \approx 0$)

4,954,834

MOVABLE OPTICAL FIBER SYSTEM FOR DIRECTING MICROWAVES

Daniel C. Buck, Hanover, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 5, 1988, Ser. No. 215,117
Int. Cl.[5] H01Q *3/00*; G01S *7/40*; G01R *35/00*
U.S. Cl. 342—360 **7 Claims**



1. A movable optical fiber system comprising:

means for generating microwave modulated optic signals of preselected phase;

photodiode means for receiving said optic signals and converting said optic signals to microwave signals;

a waveguide connected with said photodiode means for receiving said microwave signals, said waveguide having an open front portion through which said microwave signals are discharged;

fiber-optic means having an end portion connected with said optic signal generating means and an opposite end portion

connected with said photodiode means, said optic signals being passed through said fiber-optic means from said optic signal generating means to said photodiode means;

said photodiode means and said waveguide being adapted for linear movement by a motion device in a plane parallel with a phased array antenna face having a plurality of transmit-receive modules secured thereon to pass said waveguide open front portion in proximity to said plurality of modules;

said transmit-receive modules successively receiving said microwave signals discharged through said waveguide open front portion,

a motion device adapted to be positioned adjacent said phased array antenna face;

a support member connected with said motion device and having said photodiode means and said waveguide connected thereto;

said motion device being operable to move said support member with said photodiode means and said waveguide connected thereto in a preselected horizontal and vertical path parallel with said antenna face;

pulley means secured to said support member in proximity with said photodiode means and movable with said photodiode means and said waveguide;

said pulley means having a peripheral groove of preselected diameter for receiving a portion of said fiber-optic means adjacent said fiber-optic means opposite end portion; and

said peripheral groove diameter being selected to provide that said portion of said fiber-optic means in contact with said groove is flexed by less than a preselected maximum degree as said pulley is moved by said motion device to prevent a change in phase of said optic signal passed through said fiberoptic means.

4,954,835

RADIODIRECTION FINDING METHOD AND APPARATUS USING DOPPLER EFFECT FREQUENCY MODULATION

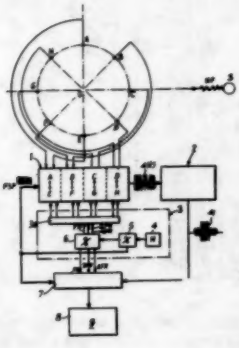
Jacques Lanciaux, Pibrac, France, assignor to Rockwell-Collins France, Blagnac, France

Continuation of Ser. No. 19,232, Feb. 26, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 271,625

Claims priority, application France, Aug. 4, 1986, 86 11279

Int. Cl.[5] G01S *3/52, 5/04, 1/44*

U.S. Cl. 342—418 **18 Claims**



1. A radiodirection finding method using Doppler effect frequency modulation for measuring the bearing of a source transmitting a high frequency signal, including a pair of real antennas, one of said antennas functioning as a reception antenna and the other of said antennas functioning as a transmission antenna, each of said antennas including several antenna strands, and said antenna strands being used in pairs diametrically spaced from each other and spaced evenly apart angularly about a circumference, and a fictitious mobile antenna having a periodic linear alternative movement between each pair of said pair of real antennas and a sampling of directions following a rotary cycle, and comprising the steps of:

selectively energizing each next adjacent pair of the diametrically spaced antenna strands sequentially in said rotary cycle in pairs of diametrically opposite strands; and

energizing the different selective pairs of diametrically opposite antenna strands successively in a angularly rotating sequence in said rotary cycle from said first pair of antenna strands energized, wherein a selection to a next direction occurs when said fictitious antenna crosses a center of a circle for avoiding any tangential movement.

4,954,836

FOLLOW-UP SYSTEM FOR MOVING BODIES

Susumu Sakuma, 16-7, Uetomino 3-chome, Kokurakita-ku, Kitakyushu-shi, Fukuoka-ken, Japan

Filed Nov. 17, 1987, Ser. No. 121,430

Claims priority, application Japan, Sep. 8, 1987, 62-224708; Oct. 27, 1987, 62-270557

Int. Cl.[5] G01S *3/02*

U.S. Cl. 342—450 **2 Claims**

1. A system for locating a moving body within a predetermined area, said moving body being accompanied by a radio signal transmitter, said transmitter having a predetermined range of transmission and transmitting a signal of predetermined frequency, said system comprising

a first antenna network and a second antenna network, said first antenna network comprising a plurality of non-directional antennae located at points disposed substantially evenly over said predetermined area, said second antennae network comprising a plurality of directional antennae located at predetermined points disposed within said predetermined area;

said non-directional antennae being located such that one or more of said non-directional antennae is always within the range of transmission of said transmitter;

each of said directional antennae being provided with means for rotation and means for measuring the strength of signals received by said directional antennae;

controlling means activated by said signal of predetermined frequency received by one or more of said non-directional antennae;

said controlling means, when activated, directing rotation of said rotation means of two of said directional antennae until the strength of signals received by said directional antennae is maximized;

said controlling means indicating the relative rotation of directional antennae rotation;

said moving body being locatable by triangulation of the relative rotation of said directional antennae;

said controlling means comprising associating pairs of directional antennae with individual non-directional antennae and said controlling means associating location points with said antennae; whereby when said controlling means is activated, said controlling means can automatically locate the moving body relative to the antennae networks

and relative to points of location of said antennae in said predetermined area; and

map information means, said controlling means associating said antennae locations with map information from said map information means regarding said predetermined area, whereby, when said controlling means associates locations of said antennae and relative rotation of said directional antennae is associated with the map information, said moving body is located.

4,954,837

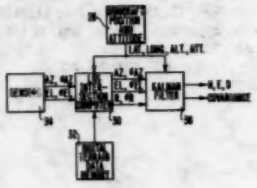
TERRAIN AIDED PASSIVE RANGE ESTIMATION

Charles A. Baird, and Noel Collins, both of Melbourne Beach, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 20, 1989, Ser. No. 382,197

Int. Cl.[5] G01S *3/02*; G01C *21/00*

U.S. Cl. 342—458 **12 Claims**



1. A method of estimating the range from a sensor platform to a ground-based target, said method comprising:

(a) acquiring navigational data indicating the platform longitude, latitude, and elevation above the earth's mean sea level;

(b) determining the elevation angle and the azimuth angle of a line of sight from the platform to the target;

(c) acquiring terrain data indicating the height of the earth's surface above mean sea level at each of a plurality of terrain data points in an area of terrain including the target location and the line of sight;

(d) calculating a test target height for a test data point located on the earth's surface and on the line of sight;

(e) comparing the calculated test target height with the height of the earth's surface at the tested terrain data point, as indicated in the terrain data;

(f) when the calculated test target height is greater than the height of the earth's surface at the tested terrain data point, selecting another test terrain data point further from the platform than the tested terrain data point and repeating steps (d) and (e) for said another test terrain data point;

(g) when the calculated test target height is not greater than the height of the earth's surface at the tested terrain data point, calculating an estimated range from the platform to the target; and

(h) applying the elevation angle, the azimuth angle, and the estimated range to a Kalman filter to provide an improved estimated range from the platform to the target.

4,954,838

PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS

Takashi Nakamura, and Kaoru Uchiyama, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1989, Ser. No. 328,261

Claims priority, application Japan, Apr. 11, 1988, 63-88554; Feb. 21, 1989, 1-41172

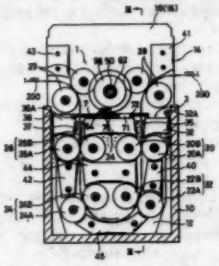
Int. Cl.[5] G03D *3/08*

U.S. Cl. 354—320 **7 Claims**

1. A photosensitive material processing apparatus adaptable for occasional operation, comprising

a processing tank which has an opening at the top and is filled with processing solution, and

means for controlling access to said processing tank through its opening such that the openness S/V during photosensitive material processing periods is in the range of from



1×10^{-4} to 1×10^{-1}/cm and the openness S/V during quiescent periods is up to 70% of the openness S/V during photosensitive material processing periods wherein V is the volume of the processing solution in the tank and S is the area of a portion of the processing solution surface which is open to the ambient atmosphere.

4,954,839

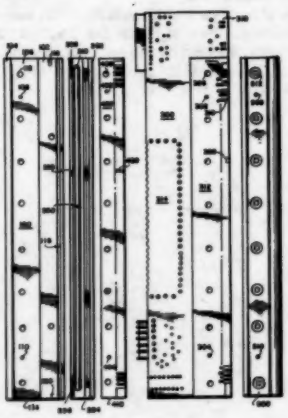
SELF-ALIGNING PRINT HEAD ASSEMBLY WITH ADVANCED SHIELDING CHARACTERISTICS

Steven A. Rogers, Leesburg; George Bockelmann, Vienna, and Gary Hester, Sterling, all of Va., assignors to Cryptek, Inc., Herndon, Va.

Filed Jul. 24, 1989, Ser. No. 383,436

Int. Cl.[5] G01D *15/10*; H05B *1/00*; B41J *3/02*

U.S. Cl. 346—76 PH **27 Claims**



1. A self-aligning print head assembly carrying a thermal print head with a connector having a plurality of connector elements thereon, comprising:

a base, having:

(a) means for aligning said thermal print head at a precise position thereon; and

(b) at least two registry means, each comprising an element extending above a top plane formed by a top surface of said base;

input/output circuitry means, having a connector with a plurality of connector elements on one side and formed

with inner surfaces that mate with said registry means to hold said input/output means in self-alignment on said base, with said connector of said input/output means aligned adjacent the connector of said thermal print head; and

cover and interface means, tightly connected against both of said print head connector and said input/output means connector, including:

(a) interface means, aligned using said registry means, for connecting at least one connector element of said print head to at least one corresponding connector element of said input/output means; and

(b) cover means, insulated from said interface means, for tightly holding said interface means against said connector of said input/output circuitry means and of said print head.

4,954,840

AUTOMATIC TICKET DISPENSER

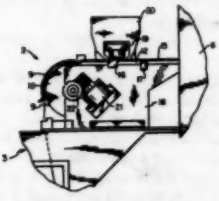
John R. Maud, and Allan S. Cooper, both of Pietermaritzburg, South Africa, assignors to Latilla Holdings (Guernsey) Limited, Guernsey, Channel Islands

Continuation-in-part of Ser. No. 7,236,644, Aug. 25, 1988, Pat. No. 4,931,884. This application Jan. 23, 1990, Ser. No. 468,916

Claims priority, application South Africa, Aug. 27, 1987, 87/6389

Int. Cl.[5] G01D *15/20*; G06K *15/00*

U.S. Cl. 346—93 **13 Claims**



1. An automatic ticket dispenser comprising ticket feed means including a rotatable sprocket drum co-operant with prepunched holes in a substantially continuous chain of tickets for dispensing tickets in a path, a print head assembly in the path of movement of tickets dispensed by the dispenser, a time clock, control circuitry connected to the time clock and print head, and a sensor co-operant with formations on the sprocket drum to control the ticket feed means through the control circuitry, the arrangement being operative to print required information concerning time, as reflected by the time clock, onto a leading ticket of a chain thereof as it is dispensed through the feed means by the sprocket drum, and wherein rotation of the sprocket drum is controlled by the control circuitry in co-operation with the sensor.

4,954,841

OPTICAL RECORDING MEDIUM AND METHOD OF MANUFACTURING THE SAME

Katsutarou Ichihara, Tokyo; Norio Ozawa, Kawasaki, and Nobuaki Yasuda, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 22, 1987, Ser. No. 111,067

Claims priority, application Japan, Oct. 25, 1986, 61-254276; Nov. 10, 1986, 61-265456; Nov. 10, 1986, 61-265457

Int. Cl.[5] G01D *9/00*

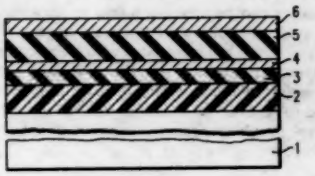
U.S. Cl. 346—135.1 **5 Claims**

1. An optical recording medium, comprising:

a transparent resin substrate;

a transparent protective layer;

transparent adhesive layer means between the resin substrate and the protective layer, including a combination of inorganic and hydrocarbon compounds for bonding the protective layer to the resin substrate and for substantially



preventing moisture from penetrating between the protective layer and the substrate; and

optical recording layer on the transparent protective layer.

4,954,842

DIAMOND PEN TYPE MARKING DEVICE FOR SUBSTRATES

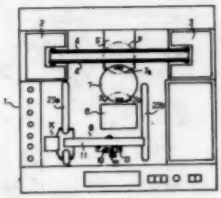
Isao Hashimoto, and Tsuyoshi Hidehira, both of Ibara, Japan, assignors to Taxmo Co., Ltd., Japan

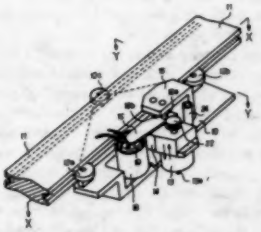
Filed Jul. 11, 1988, Ser. No. 220,182

Claims priority, application Japan, Jul. 11, 1987, 62-173535

Int. Cl.[5] G01D *15/16, 15/04*

U.S. Cl. 346—139 R **2 Claims**





1. A diamond type marking device comprising:

i. an alignment stage provided on a substrate conveying passage which carries a substrate from a loading station to an unloading station, the alignment stage aligning position of a substrate carried by the passage;

ii. a main stage located beside said alignment stage of said substrate conveying passage;

iii. a rotary absorption disk disposed between said alignment stage and said main stage, having a pair of absorption through-holes at opposite sides of an outer periphery of the disk for vacuum suction, wherein a through-hole fixes a substrate at the alignment stage and the other through-hole fixes a substrate at the main stage at the same time, and means for intermittently rotating the disk by 180

degrees, wherein the substrates fixed by a pair of through-holes are moved to opposite sides respectively, positions of the substrates being exchanged with each other;

iv. the main stage having a pen means and a pen carrying means for carrying the pen means to draw an identification mark on a substrate at the main stage;

v. said pen means being provided with a diamond pen which is supported in a pen supporting cylinder, and said pen supporting cylinder can allow pen pressure and pen drop speed to be freely and automatically changed by electric control circuit according to material or substrates to be marked.

4,954,843

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

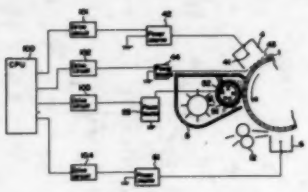
Tateki Oka; Naoki Toyoshi, and Kunio Toda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1989, Ser. No. 355,690

Claims priority, application Japan, May 24, 1988, 63-127797; May 24, 1988, 63-127798; Apr. 11, 1989, 64-92483; Apr. 11, 1989, 64-42696[U]

Int. Cl.[5] G03G *15/06, 15/02*

U.S. Cl. 355—210 **30 Claims**



1. An image forming apparatus comprising:

an electrostatic latent image bearing member which is arranged to rotate in one direction;

charging means for charging the surface of said electrostatic latent image bearing member with specified surface potential and polarity;

latent image forming means for forming a negative electrostatic latent image, which consists of non-imaged portions with the potential equal to the specified surface potential and imaged portions with substantially lower surface potential, on the surface of said electrostatic latent image bearing member which was charged with the specified surface potential by said charging means;

a scorotoron charger for charging the surface of said electrostatic latent image bearing member on which an electrostatic latent image has just been formed with the polarity opposite to that charged by said charging means in order to reduce the surface potential of said non-imaged portions, with its grid impressed with a voltage with the same polarity as that charged by said charging means and a value lower than that of the surface potential of the non-imaged portions; and

developing means for performing reversal development of the electrostatic latent image which passed through said scorotoron charger, with use of toner charged with the same polarity as that charged by said charging means, with its developing electrode impressed with a developing bias voltage with the same polarity as that charged by said charging means and a value lower than that of the surface potential of the non-imaged portions but higher than a developing threshold value.

4,954,844

MULTICOLOR IMAGE DEVELOPING DEVICE

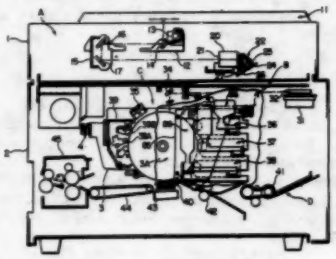
Shizuo Morita; Toru Matsumoto; Masayuki Kamegamori; Kazushi Hayakawa; Noboru Hatakeyama; Shunji Matsuo, and Masakazu Fukuchi, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,607

Claims priority, application Japan, Dec. 17, 1987, 62-320596; Dec. 17, 1987, 62-320597; Dec. 26, 1987, 62-331227

Int. Cl.[5] G03G *15/01, 15/08*

U.S. Cl. 355—260 **10 Claims**



1. An apparatus for forming a color image on an image carrier which is rotatable about its axis in a rotation direction, said apparatus comprising,

an exposure device adapted to form a latent image on said image carrier,

a plurality of developing devices, each of said plurality of developing devices adapted to form a color toner image and having a toner replenishing device,

a transfer device for transferring said color toner image from said image carrier to a copy paper,

a housing member for housing at least said image carrier, said plurality of developing devices and said replenishing devices as a single unit, and

a guide member for guiding said housing member whereby said housing member is movable in a direction parallel to said axis, thereby permitting attachment and detachment of said unit to and from said apparatus,

wherein said toner replenishing devices are mounted at one end of said housing member.

4,954,845

IMAGE FIXING DEVICE AND IMAGE FORMING APPARATUS WITH SAME

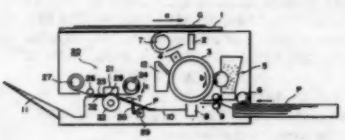
Kanji Yano; Yasutsugu Saijo; Kensaku Kusaka, all of Kawasaki, and Hiromitsu Hirabayashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,970

Claims priority, application Japan, Aug. 2, 1988, 63-193263; Sep. 16, 1988, 63-231629; Sep. 16, 1988, 63-231631; Sep. 26, 1988, 63-240398; Oct. 13, 1988, 63-259193; Dec. 19, 1988, 63-320009

Int. Cl.[5] G03G *15/20, 15/08, 15/21*

U.S. Cl. 355—290 **42 Claims**



1. An image fixing apparatus, comprising:

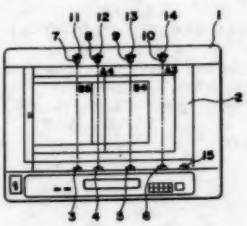
heating means;
a non-endless film movable together with a toner image supporting medium supporting a toner image, wherein the toner image on the supporting medium is heated by said heating means through said film;
rewinding means for rewinding said film in a direction opposite to a movement direction of said toner image supporting medium;
pressing means for press-contacting said film to said heating means and to said image supporting medium;
wherein said rewinding means rewinds said film while said pressing means does not perform it pressing operation.

4,954,846

DETECTING DEVICE FOR DETECTING THE SIZE AND/OR PRESENCE OF AN ORIGINAL DOCUMENT

Toshihisa Matsuo, Yamatokooriyama, and Toshio Yamagishi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 22, 1989, Ser. No. 440,268
Claims priority, application Japan, Nov. 22, 1988, 63-294966; Nov. 24, 1988, 63-296752
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—311 9 Claims



1. An original document detecting device for detecting whether an original document is present or absent, comprising:
at least one pair of elements that includes a light emitting element and a light receiving element oppositely disposed to each other on both sides of an original placing platform which is used for placing an original document thereon,
detecting means for detecting whether the light beam emitted from said light emitting element is received by said light receiving element or interrupted by an original document, thereby detecting the presence or absence of the original document in dependence on the output value of said light receiving element,
sensor means for detecting a quantity of disturbance light around the detecting device,
control means for controlling the quantity of the light beam to be emitted from said light emitting element dependent on the output value of said sensor means.

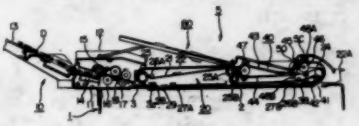
4,954,847

RECIRCULATING AUTOMATIC DOCUMENT FEEDER

Kazushige Murata, and Mitsuru Nagoshi, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 19, 1988, Ser. No. 196,122
Claims priority, application Japan, May 22, 1987, 62-126751; May 22, 1987, 62-126756; May 22, 1987, 62-126757; May 22, 1987, 62-126762; May 22, 1987, 62-77788
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—318 14 Claims

1. A sheet conveyance apparatus for conveying an original document sheet onto a platen glass through which the sheet is irradiated by light source to obtain an image light, said sheet conveyance apparatus having a one side mode for irradiating one side of said document sheet and a both side mode for irradiating both sides of said document sheet, said conveyance apparatus comprising:
cover means for covering the platen glass, said cover means including a unit housing pivotally mounted on said platen glass so that the bottom surface of said unit housing covers said platen glass;
conveyor means, disposed on the bottom surface of said unit housing, for loading the sheet onto said platen glass and discharging the sheet from said platen glass;
a delivery tray for receiving the irradiated sheet thereon;
a first passage including a path connecting said platen glass and said delivery tray so that through said first passage the



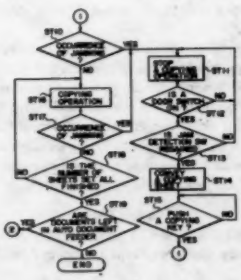
sheet is loaded on said platen glass and is discharged to said delivery tray;
a second passage for reversing document sheets to be irradiated on both sides;
switching means for selecting said first passage or said second passage in accordance with the irradiation mode;
said second passage, being disposed between said conveyor means and the top surface of said unit housing, forming a loop passage and having an inversion roller so that through said second passage the sheet discharged from the platen glass is reversed and loaded again on the platen glass.

4,954,848

CONTROL APPARATUS FOR A TWO-SIDED/MULTIPLE COPY CONVEYING UNIT

Tatsunori Arima, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 18, 1989, Ser. No. 353,554
Claims priority, application Japan, May 18, 1988, 63-119207
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—319 7 Claims



1. A control apparatus for a conveying unit which stacks sheets in a stacking means, each sheet having an image formed on one side thereof, and conveys the stacked sheets to an image forming means via a conveying path, the control apparatus comprising:
first detecting means for detecting a sheet flow abnormality during conveyance of the sheets via the conveying path;
second detecting means for detecting removal of the abnormality detected by the first detecting means; and
means for conveying the next sheet in the stacking means into proximity with the image forming means before the

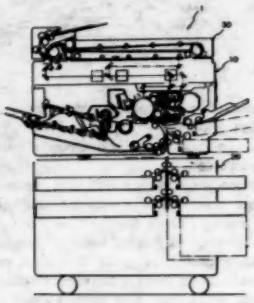
image forming means forms a further image on the sheet when the second detecting means detects removal of the abnormality.

4,954,849

COPYING APPARATUS OPERABLE IN A TWO-SIDE COPY MODE

Tadao Koike; Koichi Noguchi, both of Tokyo; Hiroshi Takahashi, Kawasaki, and Koichi Tsunoda, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 370,187
Claims priority, application Japan, Jun. 23, 1988, 63-153609
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—319 **2 Claims**



1. A copying apparatus having a two-side copying function which reproduces an image representative of an original document on one side of a paper sheet by image forming means and image fixing means, stacks the resulting one-sided paper sheet temporarily on a refeed tray, refeeds said one-sided paper sheet in response to a refeed command while turning over said paper sheet, and reproduces an image representative of an original document on the other side of said paper sheet by said image forming means and said image fixing means, said apparatus comprising:

a first switchback transport path located in close proximity to and downstream of the image fixing means for transporting paper sheets of comparatively small sizes to said refeed tray;

a second switchback transport path located downstream of said first switchback transport path for transporting paper sheets of comparatively large sizes to said refeed tray; and

guide means positioned on said second switchback transport path tray for selecting either one of said first and second switchback transport paths and guiding the paper sheets to said selected switchback transport path.

4,954,850

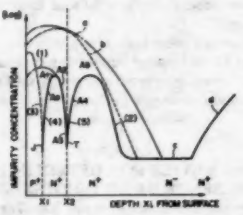
VARIABLE-CAPACITANCE DIODE DEVICE

Takeshi Kasahara, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Aug. 12, 1988, Ser. No. 231,714
Claims priority, application Japan, Aug. 25, 1987, 62-210852
Int. Cl.[5] H01L 29/93
U.S. Cl. 357—14 **1 Claim**

1. A variable-capacitance diode device including a PN junction, and a semiconductor layer of a first conductivity type, the impurity concentration of which decreases with increasing depth from the PN junction, characterized in that except in the vicinity of the PN junction, said semiconductor layer of the first conductivity type formed through superimposition of first and second conductivity type impurity elements includes at least one point where said first conductivity type impurity element is close in concentration to said second conductivity type impurity element and the following relationship holds true:

$$A_i \leq A_{i+1} \ (i=1, 2, \ldots, n)$$



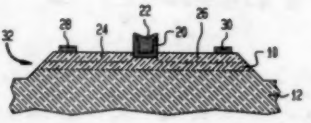
where A_i represents impurity concentration of said semiconductor layer of the first conductivity type at a distance X_i as viewed depth-wise of the PN junction.

4,954,851

SCHOTTKY BARRIER ON INDIUM GALLIUM ARSENIDE

Winston K. Chan, Fair Haven, N.J., assignor to Bell Communications Research Inc., Livingston, N.J.

Filed May 26, 1988, Ser. No. 199,171
Int. Cl.[5] H01L 29/48
U.S. Cl. 357—15 **3 Claims**



1. A semiconductor device comprising

a substrate comprising indium gallium arsenide,

a cadmium-containing layer on said substrate,

and a conductive layer overlying said cadmium-containing layer to form a Schottky-barrier contact with said substrate,

wherein said substrate comprises an epitaxial layer of $In_{0.53}Ga_{0.47}As$,

wherein said epitaxial layer of $In_{0.53}Ga_{0.47}As$ overlies an epitaxial layer comprising indium phosphide,

and wherein said cadmium-containing layer constitutes a dielectric selected from the group consisting of oxides and carbonates of cadmium.

4,954,852

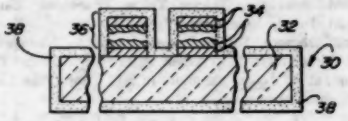
SPUTTERED METALLIC SILICIDE GATE FOR GAAS INTEGRATED CIRCUITS

Zachary Lemnios, Colorado Springs, Colo., assignor to Ford Microelectronics, Inc., Colorado Springs, Colo.

Filed Dec. 24, 1987, Ser. No. 138,504
Int. Cl.[5] H01L 29/78
U.S. Cl. 357—15 **11 Claims**

1. A GaAs integrated circuit structure, comprising a GaAs substrate and a metallic silicide gate formed of at least three sequentially sputtered, multiple layers of silicon and a metal

deposited onto the GaAs substrate, said multiple layers including a first layer and having at least two subsequent layers



sputtered thereon, wherein said multiple layers have an individual thickness of from about 50 to 100 angstroms each.

4,954,853

OPTICAL SEMICONDUCTOR DEVICE

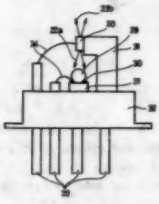
Kazuomi Yoshida; Hideyo Higuchi; Hitoshi Mizuochi, and Yousuke Yamamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 7,013, Jan. 27, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 220,338

Claims priority, application Japan, Jan. 24, 1986, 61-14081

Int. Cl.[5] H01L *33/00*

U.S. Cl. 357—17 **10 Claims**



1. In an optical semiconductor device including a light emitting element and a light receiving photo-electric conversion element for monitoring the condition of emission of said light emitting element, the improvement comprising:

preventing means for preventing light emitted by said light emitting element from returning to said light emitting element, and

mounting means for mounting said preventing means on said light receiving photo-electric conversion element independently of angular constraints therefor,

wherein said photo-electric conversion element is mounted having a surface substantially parallel to a light emitting surface of said light emitting element.

4,954,854

CROSS-POINT LIGHTLY-DOPED DRAIN-SOURCE TRENCH TRANSISTOR AND FABRICATION PROCESS THEREFOR

Sang H. Dhong, Mahopac; Wei Hwang, Armonk, and Nicky Chau-Chun Lu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1989, Ser. No. 355,232

Int. Cl.[5] H01L *29/78, 29/06, 27/10*

U.S. Cl. 357—23.4 **3 Claims**

1. A self-aligned, slightly-doped drain/source field effect trench transistor device comprising:

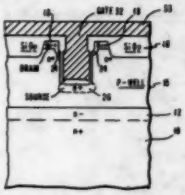
a substrate having a lower portion of heavily doped n+ conductivity semiconductor material, the upper portion of said substrate being light doped n− conductivity epitaxial semiconductor material, said upper lightly doped portion being less conductive than said heavily doped lower portion,

a well region formed with p-type dopants disposed in said upper portion of said substrate.

at least one polysilicon filled trench extending from the surface of said well region and into said well region, said trench being electrically isolated from said well region by a layer of gate oxide insulation on the bottom and sidewalls of said trench between the well region and said polysilicon in said trench,

a source junction region located in said well region beneath the bottom surface of said trench,

a diffusion region forming a first drain junction region disposed in said well region, said first drain junction region



being heavily doped with n++ type dopants, said first drain junction region being located on the surface of said well regional surrounding said trench,

a second lightly-doped drain junction region lightly doped with n+ type dopants in said well region proximate said first drain junction region and being self-aligned with the upper portion of said sidewalls of said trench, and

a polysilicon word line element disposed over said polysilicon filled trench.

4,954,855

THIN FILM TRANSISTOR FORMED ON INSULATING SUBSTRATE

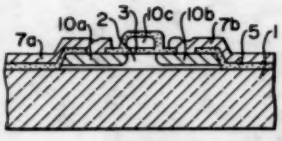
Akio Mimura, Katsuta; Yoshikazu Hosokawa, Hitachiota; Takaya Suzuki, Katsuta; Takashi Aoyama, Ibaraki; Nobutake Konishi, Hitachiota; Yutaka Mizuwa, and Kenji Miyata, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 848,474, Apr. 7, 1986, abandoned. This application Oct. 28, 1987, Ser. No. 113,360

Claims priority, application Japan, Apr. 8, 1985, 60-72636; Jun. 3, 1985, 60-118811

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.7 **22 Claims**



1. A coplanar thin film transistor formed on an insulating substrate, comprising:

a glass substrate;

a thin semiconductor film formed on said glass substrate and having the form of an island, said thin semiconductor film being in one of a polycrystalline state and an amorphous state and including silicon;

a gate structure formed on part of the thin semiconductor film, the gate structure including a gate insulating film and a gate electrode formed on the gate insulating film and made of platinum silicide, said gate insulating film being formed on said thin semiconductor film; and

a pair of intermetallic compound layers formed in said thin semiconductor film at such locations that a portion of said

thin semiconductor film which exists beneath said gate insulating film is sandwiched between said intermetallic compound layers, each of the intermetallic compound layers being formed of a metal silicide, the pair of intermetallic compound layers respectively constituting a source region and a drain region of the transistor, and said portion of said thin semiconductor film being a channel between the source and drain regions, and each of said intermetallic compound layers being insulated from said gate electrode by said gate insulating film, the metal silicide of each of said intermetallic compound layers being formed of a metal and silicon forming said thin semiconductor film.

4,954,856

SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE AND METHOD OF MAKING THE SAME

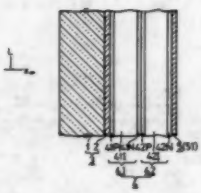
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 45,225, Apr. 30, 1987, abandoned, which is a continuation of Ser. No. 733,738, May 14, 1985, abandoned. This application Apr. 10, 1989, Ser. No. 336,550

Claims priority, application Japan, May 15, 1984, 59-097318; May 15, 1984, 59-097319; May 15, 1984, 59-097320

Int. Cl.[5] H01L *27/14, 31/00*

U.S. Cl. 357—30 4 Claims



1. A tandem photoelectric conversion device comprising:

a first photoelectric conversion device incorporating a PIN junction where at least the portions of the I layer adjacent the P and N layers are crystallized where the degree of said crystallization of said portions of the I layer is greater than that of the P and N layers;

a second photoelectric conversion device directly formed on said first device;

at least one of the P-type semiconductor layer and the N-type semiconductor layer which constitute a PN junction between said first and second device being made of silicon carbide; and

where said I layer is photoannealed and contains one atom % or less oxygen.

4,954,857

PHOTOGRAPHIC FILM PACKAGE AND METHOD OF MAKING THE SAME

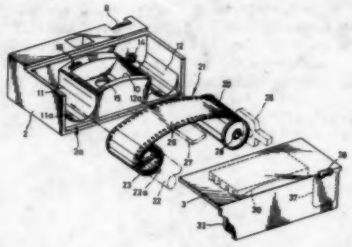
Mitsuyoshi Mochida, Tokyo; Tokuo Maekawa, Kanagawa; Hisashi Takei, Kanagawa; Yasuo Matsumoto, Kanagawa; Hiroshi Ohmura, Tokyo; Shigeru Sugimoto, Kanagawa; Seimei Ushiro, Tokyo; Seiji Asano, Saitama, and Toshio Yoshida, Ibaragi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 87,388, Aug. 20, 1987, Pat. No. 4,884,087. This application Sep. 19, 1989, Ser. No. 409,420

Claims priority, application Japan, Aug. 20, 1986, 61-126942; Oct. 17, 1986, 61-246977; Oct. 17, 1986, 61-246978; Jan. 19, 1987, 62-5694; Jan. 19, 1987, 62-5698; Feb. 14, 1987, 62-32185

Int. Cl.[5] G03B *1/10, 1/66, 17/02, 17/28*

U.S. Cl. 354—75 30 Claims



1. A lens-fitted photographic film package having an externally operable member for effecting an exposure, comprising:

a light-tight casing having an opening through which said exposure is made when said externally operable member is operated;

a roller unexposed film disposed on one side of said opening in an unexposed film roll receiving chamber in said light-tight casing with its outermost turn exposed to side walls of said chamber and its innermost turn surrounding an empty space;

a removable light-tight film container having a film winding spool therein disposed on the opposite side of said opening in said light-tight casing from said rolled film, one end of said rolled film being attached to said film winding spool;

means for winding said rolled film into said light-tight film container and around said film winding spool; and

means defining a film passage in said light-tight casing, wherein said light-tight casing must be destroyed to expose said film passage.

4,954,858

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE

Hiroshi Ohmura; Takuya Arai; Akira Haishi; Katsuya Kozai; Hiroshi Hara, all of Tokyo; Takashi Tobioka, Saitama; Seiji Asano, Saitama, and Junichi Takagi, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1989, Ser. No. 314,214

Claims priority, application Japan, Feb. 22, 1988, 63-21932[U]; Feb. 22, 1988, 63-21935[U]; Feb. 22, 1988, 63-21936[U]

Int. Cl.[5] G03B *15/05, 17/02*

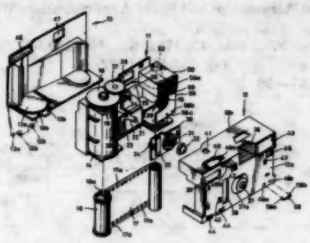
U.S. Cl. 354—145.1 21 Claims

1. A lens-fitted photographic film package having at least a roll of unexposed photographic film, a taking lens, shutter means and film transporting means, said lens-fitted photographic film package comprising:

a main case section which is open at its front, said main case section mounting at least said shutter means and said film transporting means and containing light-tightly said roll of unexposed photographic film;

a front cover section which is attached to said main case

section and closes said open front of said main case section to cover the majority of said taking lens and said shutter means and said film transporting means, said front cover section being formed with at least one opening for partly



receiving therein a member of one of said means, which member projects forwardly beyond surfaces of said main case section which are in contact with an inner surface of said front cover section when said front cover section is securely attached to said main case section.

4,954,859

MOTOR DRIVEN CAMERA

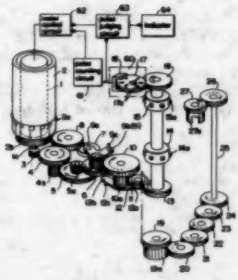
Toshiyuki Kitazawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,362

Claims priority, application Japan, Jan. 28, 1988, 63-17609; Jan. 28, 1988, 63-17610

Int. Cl.[5] G03B *1/12*

U.S. Cl. 354—173.11 27 Claims



1. A motor driven camera having a motor for winding a film, said camera comprising a pulse generator which generates one pulse for every predetermined number of perforations of the film in association with feeding of the film, means for counting the number of pulses generated by said pulse generator, and a motor control circuit which stops said motor when said pulse counting means counts a predetermined number of pulses.

4,954,860

FOCAL-PLANE SHUTTER

Tadashi Nakagawa; Takahito Otora, and Ichiro Nemoto, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

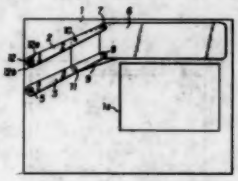
Filed May 2, 1989, Ser. No. 346,100

Claims priority, application Japan, May 11, 1988, 63-61939[U]

Int. Cl.[5] G03B *9/40*

U.S. Cl. 354—246 14 Claims

1. A focal-plane shutter comprising a base member having an aperture, shutter blades for opening and closing said aperture, and pivotal support means on said base member operable in a parallelogrammatic configuration to move said blades between open and closed positions to thereby open and close said aperture, said pivotal support means having adjusting means for



adjusting the tilt of said blades relative to said aperture to provide for parallel movement of said blades and uniformity of exposure of said aperture during opening and closing of said aperture by said blades.

4,954,861

METHOD OF DRIVING MULTIPLE FLASH RANGEFINDER

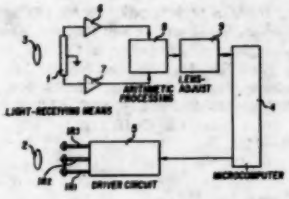
Shinji Nagaoka; Michio Kawai, and Koji Sato, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed May 22, 1989, Ser. No. 355,596

Claims priority, application Japan, May 25, 1988, 63-127520

Int. Cl.[5] G03B *3/00*; G01C *3/08*

U.S. Cl. 354—403 6 Claims



1. A method of operating a multiple flash rangefinder of the type having light-emitting means for emitting light to a subject, a light-receiving means receiving the light reflected from the subject and an arithmetic processing unit that receives an output signal from the light-receiving means and calculates the distance to a subject, the method comprising the steps of emitting flashes of light from a plurality of light-emitting means in successive order one at a time, repeating a plurality of times said step of emitting said flashes of light from said plurality of light-emitting means in successive order one at a time and utilizing said light-receiving means and said arithmetic process unit to calculate the distance for each successive and repeated light emission, whereby the repeated emissions provide for minimizing the heat generated by said light-emitting means.

4,954,862

EXPOSURE APPARATUS FOR COLOR IMAGING SYSTEM

Sungnuk Lee, Miamisburg, Ohio, and Shigemi Misono, Tokyo, Japan, assignors to The Mead Corporation and Seiko Instruments Inc., Japan

Filed Jun. 6, 1988, Ser. No. 203,007

Claims priority, application Japan, Jun. 5, 1987, 62-141277

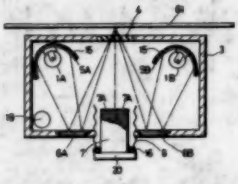
Int. Cl.[5] G03B *27/00, 27/72*

U.S. Cl. 355—1 15 Claims

1. An exposure apparatus for exposing a photosensitive sheet comprising:

a light source for providing irradiating light to an original image;

a cold mirror for reflecting visible light from said light source toward said original image and for allowing infrared rays and a portion of the visible light nonrepresentative of the original image to pass therethrough, said portion of visible light passing through said cold mirror being incident on the photosensitive sheet; and



optical members for focusing light representative of the original image reflected from said original image onto said photosensitive sheet.

4,954,863

IMAGE FORMING APPARATUS

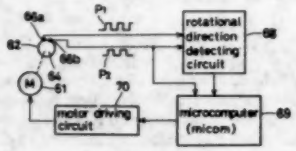
Hiroyuki Harada, Sakai, and Tetsuji Kajitani, Kawanishi, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,316

Claims priority, application Japan, Nov. 19, 1987, 62-292844; Nov. 19, 1987, 62-292845; Nov. 19, 1987, 62-292846

Int. Cl.[5] G03B 27/34

U.S. Cl. 355—51 **17 Claims**



1. An image forming apparatus comprising:

a movable optical system for reading an original image,

a motor having a shaft for driving said movable optical system,

a motor driving circuit,

an encoder which generates signals indicative of velocities of said motor shaft, and

a control circuit which controls said motor driving circuit to drive said motor to move said movable optical system from a home position to a predetermined point and from said point to return to said home position, said control circuit controlling said motor driving circuit to brake said motor as said movable optical system approaches said home position, said control circuit comprising timing deciding means, responsive to shaft velocity signals from said encoder, for calculating an acceleration of said motor shaft as said motor accelerates said optical system from said home position toward said predetermined point and for deciding timing for braking said motor based upon said calculated acceleration.

4,954,864

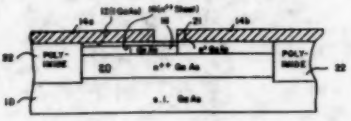
MILLIMETER-WAVE MONOLITHIC DIODE-GRID FREQUENCY MULTIPLIER

Joseph Maserjian, La Crescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 13, 1988, Ser. No. 283,673

Int. Cl.[5] H01L 27/14

U.S. Cl. 357—30 **13 Claims**



1. A semiconductor diode structure useful for harmonic generation of millimeter or submillimeter wave radiation from a fundamental input wave comprising

a substrate,

a n++ doped layer of semiconductor material on said substrate,

a layer of intrinsic semiconductor material on said n++ doped layer,

a sheet of positive charge firmed by surface n++ doping said intrinsic layer on the surface thereof opposite said n++ doped layer, and,

a Mott-type barrier formed over said sheet of n++ doping by a layer of material electrically insulating said sheet from at least one of a pair of surface metal contacts, at least one of said surface contacts being deposited over said layer of electrically insulating material with a gap between said surface contacts.

4,954,865

INTEGRATED CIRCUITS

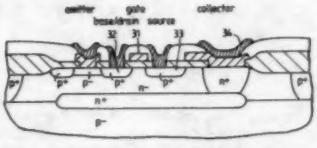
George H. S. Rokos, Bishop's Stortford, Great Britain, assignor to STC PLC, London, England

Filed May 5, 1989, Ser. No. 348,258

Claims priority, application United Kingdom, May 10, 1988, 8810973

Int. Cl.[5] H01L 27/02

U.S. Cl. 357—43 **2 Claims**



1. An integrated circuit structure adapted to provide a desired circuit function having a structure forming an element of any array of similar structures, the structure comprising a silicon semiconductor p^--type substrate, an n^--type epitaxial layer disposed on a major surface of the substrate, an n^+-type layer disposed between the epitaxial layer and the substrate and providing a burried layer below the epitaxial layer, an n^+-type sinker extending from the free surface of the epitaxial layer through that layer and providing electrical contact to the buried layer, a region of p^--type material formed in the free surface of the epitaxial layer and spaced from said sinker, an insulating layer extending over the free surface of the epitaxial layer and having first and second openings in register with the p^--type region and the sinker respectively, and a layer of polycrystalline silicon (polysilicon) applied to the surface of

the structure and contacting the sinker via said openings, the structure being such that it is configurable by subsequent patterning of the polysilicon layer to define a polysilicon emitter body over the p^--type region and a gate electrode on the oxide layer in a region between the emitter body and the sinker, said emitter body and gate electrode providing ion implementation masks for the fabrication of a polysilicon emitter transistor and a field effect transistor respectively.

4,954,866

SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY

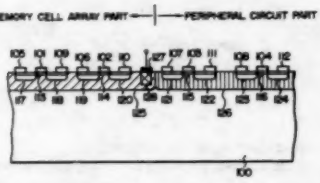
Hirotoshi Tanaka, Yamanashi; Hiroki Yamashita, Hachioji; Noboru Masuda, Kokubunji; Junji Shigeta, Fuchu; Yasunari Umemoto, Tokorozawa, and Osamu Kagaya, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,250

Claims priority, application Japan, Sep. 24, 1987, 62-237130

Int. Cl.[5] H01L *27/10, 29/80, 27/04*

U.S. Cl. 357—45 **25 Claims**



1. A semiconductor integrated circuit memory comprising:
a memory cell array part having a plurality of memory cells arranged in the form of a matrix;
a peripheral circuit part for selecting a desired one of the memory cells to perform read and write operations for the desired memory cell; and
an impurity-doped layer formed under and between circuit elements making up the memory cell array part and the peripheral circuit part, the impurity-doped layer being opposite in conductivity type to another impurity-doped layer for making the circuit elements, the impurity-doped layer formed under and between the circuit elements of the memory cell array part being different in impurity concentration from the impurity-doped layer formed under and between the circuit elements of the peripheral circuit part.

4,954,867

SEMICONDUCTOR DEVICE WITH SILICON OXYNITRIDE OVER REFRACTORY METAL GATE ELECTRODE IN LDD STRUCTURE

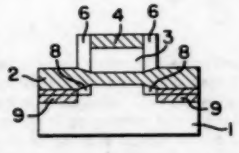
Takashi Hosaka, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Jun. 1, 1988, Ser. No. 201,052

Claims priority, application Japan, Jun. 18, 1987, 62-152236

Int. Cl.[5] H01L *29/78, 21/94*

U.S. Cl. 357—52 **10 Claims**



1. A semiconductor device comprising: a silicon substrate; an insulation layer formed on said silicon substrate; a gate electrode composed of high melting point metal provided on said insulation layer; first source and drain regions provided in said substrate and spaced apart by a first channel region defined substantially by the width of said gate electrode; at least one layer of silicon oxynitride covering the top and each side of said gate electrode; and second source and drain regions provided in said substrate and spaced apart by a second channel region defined substantially by the combined widths of said gate electrode and said silicon oxynitride layer.

4,954,868

MOS SEMICONDUCTOR DEVICE WHICH HAS HIGH BLOCKING VOLTAGE

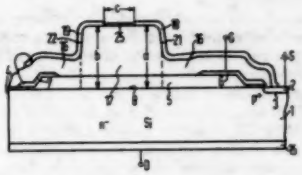
Rainer Bergmann, Rohrbach, and Josef-Matthias Gantioler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 20, 1989, Ser. No. 341,044

Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816257

Int. Cl.[5] H01L *29/40, 29/78*

U.S. Cl. 357—53 **5 Claims**



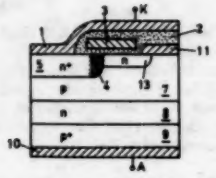
1. A semiconductor component which has a semiconductor body comprising:
(a) at least one planar zone (2) embedded in a surface (8) of the semiconductor body, said one planar zone forming a pn-junction with the adjacent portion of the semiconductor body;
(b) a first insulating layer (5) on the surface (8) of the semiconductor body;
(c) a channel stopper electrode (7) formed on the first insulating layer (5) at the edge (4) of the semiconductor body;
(d) an electrode (6) formed over the pn-junction (3) adjoining the planar zone (2) and formed on the first insulating layer;
(e) said electrode (6) and said channel stopper electrode (7) covered by a second insulating layer (16);
(f) a channel stopper field plate (19) formed on the second insulating layer (16) and said channel stopper field plate covering the channel stopper electrode (7) at least at that side facing away from the edge (4) of the semiconductor body and electrically connected to the channel stopper electrode;
(g) an anode field plate (18) formed on the second insulating layer (16) and said anode field plate covering the electrode (6) at least at that side facing away from the planar zone (2) and electrically connected to the planar zone (2);
(h) a space (c) between said channel stopper field plate (19) and said anode field plate (18),
(i) said second insulating layer (16) has a region (17) between said electrode (6) and said channel stopper electrode (7) which is thicker than the region over said electrodes;
(j) the end of the anode field plate facing toward the edge of the semiconductor body and the end of the channel stopper field plate facing away from the edge of the semiconductor body lie on said region (17) of greater thickness, and wherein the region (17) of greater thickness is covered with an insulating passivation layer (25) between the field plates (6, 7).

4,954,869

MOS-CONTROLLED THYRISTOR (MCT)

Friedhelm Bauer, Würenlingen, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Mar. 2, 1989, Ser. No. 318,154
Claims priority, application Switzerland, Mar. 10, 1988, 903/88
Int. Cl.[5] H01L 29/74
U.S. Cl. 357—38 4 Claims



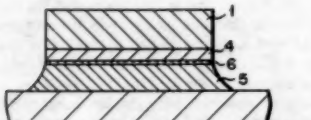
1. An MOS-controlled thyristor (MCT) with an anode and a cathode, comprising:
a sequence of alternatively doped layers comprising a p-type emitter layer, an n-type base layer, a p-type base layer and an n-type emitter-layer provided between said anode and said cathode;
a plurality of cathode shorts which can be controlled via a MOSFET structure provided on the side of said cathode, said MOSFET structure having a source region and a combined channel-drain region having a channel and a drain portion, all being n-type, and an insulated gate electrode covering said channel portion, said MOSFET structure short-circuiting said p-type base layer to a cathode contact in the switched-on state; wherein
said p-type base layer is connected to said drain portion via a drain contact,
said source region is a part of said n-type emitter layer which is connected to said cathode contact,
said channel portion and said drain portion have the same depth and doping concentration, and said combined region is disposed between said source region and said drain contact.

4,954,870

SEMICONDUCTOR DEVICE

Momoko Takemura, Tokyo; Michihiko Inaba, Yokohama; Toshio Tetsuya, Hyogo, and Mitsuo Kobayashi, Aioi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1985, Ser. No. 804,617
Claims priority, application Japan, Dec. 28, 1984, 59-276075; Dec. 28, 1984, 59-276077; Dec. 28, 1984, 59-276104
Int. Cl.[5] H01L 23/54, 23/48
U.S. Cl. 357—67 14 Claims



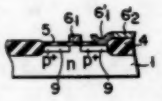
1. A semiconductor device in which a semiconductor chip is fixed to a base by a solder material layer made of an alloy containing tin and copper, wherein
a first metal layer consisting of a member selected from the group consisting of titanium, chromium, vanadium, zirconium, niobium, and an alloy containing not less than 75 atomic % of at least one thereof is interposed between said solder material and said semiconductor chip so as to have a thickness falling within a range between 2,000 Å to 3 μm.

4,954,871

SEMICONDUCTOR DEVICE WITH COMPOSITE ELECTRODE

Yoshihisa Mizutani, 2-11-23, Minamikugahara, Oota-ku, Tokyo, and Minoru Kimura, 666-4, Komaoka-cho, Tsurumi-ku, Yokohama-shi, both of Japan

Continuation of Ser. No. 778,777, Sep. 24, 1985, abandoned, which is a continuation of Ser. No. 390,030, Jun. 18, 1982, abandoned. This application Jan. 21, 1988, Ser. No. 147,107
Claims priority, application Japan, Jun. 26, 1981, 56-99357
Int. Cl.[5] H01L 23/48
U.S. Cl. 357—67 7 Claims



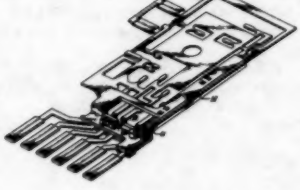
1. A semiconductor device comprising:
a field effect transistor having a source, a drain, and a channel region of a first semiconductor material; and
a single continuous wiring layer extending in a wiring layer plane, said wiring layer comprising an electrode portion made of a second semiconductor material coupled to said channel region to form a gate electrode, and an interconnection portion made of a metal compound of said second semiconductor material adapted for connection to associated circuitry, said wiring layer having, at all positions, a substantially homogeneous composition in a direction perpendicular to said wiring layer plane.

4,954,872

ELECTRICAL CONTACT STABILIZER ASSEMBLY

Richard W. Peterson, Utica, and Charles J. Malo, Frazer, both of Mich., assignors to Altair International, Inc., Mt. Clemens, Mich.

Filed Apr. 29, 1988, Ser. No. 188,373
Int. Cl.[5] H01L 23/48, 23/50
U.S. Cl. 357—70 13 Claims



1. An electrical contact assembly comprising:
a leadframe having at least one plurality of leads disposed in spaced relationship each terminating at one end in a respective contact, and terminating at an opposite end in a plurality of contact fingers at a site for mounting an electronic circuit to which the leads are connected;
a first integral member of electrically insulative material including:
an end section;

a stabilizer extending from said end section; and
at least one connecting element
a second integral member of electrically insulative material including:
an end section;
a stabilizer extending from said end section;
at least one integrally formed raised element extending from said end section and dimensioned for insertion between selected adjacent ones of said plurality of leads;
an integrally formed ridge extending substantially the length of said stabilizer and dimensioned for insertion between selected adjacent ones of said plurality of leads; and
at least one connecting element cooperative with said at least one connecting element of said first integral member to interconnect said first and second integral members with said leadframe sandwiched therebetween.

4,954,873

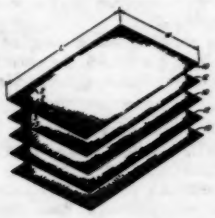
ELECTRICAL CONNECTOR FOR SURFACE MOUNTING

James Lee, Los Altos Hills; Richard Beck, Cupertino; Chune Lee, San Francisco, and Edward Hu, Sunnyvale, all of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 757,600, Jul. 22, 1985, Pat. No. 4,729,166. This application Jan. 25, 1988, Ser. No. 147,779

Int. Cl.[5] H01L *23/12, 23/14*

U.S. Cl. 357—72 **11 Claims**



1. An anisotropic elastomeric conductor, comprising a plurality of metal fibers in a matrix, wherein said metal conductors are oriented parallel to each other and said matrix includes both a fiber component and an elastomeric resin component, said anisotropic elastomeric conductor having peripheral dimensions in the range from 0.5 to 10 cm and a thickness in the range from 0.02 to 0.4 cm, wherein said thickness is defined by the direction of the metal fibers.

4,954,874

PACKAGE SEMICONDUCTOR DEVICE USING CHALCOGENIDE GLASS SEALING

Yasuaki Miura, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

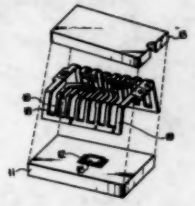
Continuation of Ser. No. 212,452, Dec. 3, 1980, abandoned. This application Sep. 8, 1983, Ser. No. 529,936

Claims priority, application Japan, Dec. 12, 1979, 54-160245

Int. Cl.[5] H01L *45/00, 23/30, 23/02, 39/02*

U.S. Cl. 357—74 **6 Claims**

1. A packaged semiconductor device comprising: a ceramic base body of a package;
a semiconductor element mounted on said ceramic base body;
a ceramic lid body of said package for sealing said semiconductor element;
a layer of a bonding agent hermetically sealing said ceramic base body and said ceramic lid body, said bonding agent consisting of a chalcogenide glass selected from the group consisting of Si-As-Te, Si-As-Se, Ge-As-Se and Ge-As-Te glasses, said chalcogenide glass including oxide glass components in an amount of 1 mol percentage to 20 mol percentage and having been heated up to, but not above, 300° C.; and



leads, each having one end connected to electrodes of said semiconductor element and the other end extending outside said package.

4,954,875

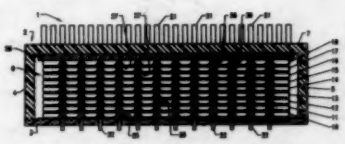
SEMICONDUCTOR WAFER ARRAY WITH ELECTRICALLY CONDUCTIVE COMPLIANT MATERIAL

Ken Clements, Santa Cruz, Calif., assignor to Laser Dynamics, Inc., Scotts Valley, Calif.

Continuation-in-part of Ser. No. 6/887,129, Jul. 17, 1986, Pat. No. 4,897,708. This application Oct. 28, 1987, Ser. No. 414,633

Int. Cl.[5] H01L *23/16*

U.S. Cl. 357—75 **21 Claims**



1. A semiconductor wafer array comprising:
a plurality of wafers of semiconductors material which are stacked one on top of another, each of said plurality of wafers having
(a) a via which is in registration with a via in an adjacent wafer, said via in each of said plurality of wafers having a first end terminated by a first hole in a first surface of each of said wafers, a second end terminated by a second and relatively larger hole in a second and opposite surface of each of said wafers, and an inwardly directed wall surface in at least a portion of the wall between said first and said second ends;
(b) means for electrically insulating an exposed surface of said via in each of said plurality of wafers between said first and said second ends;
(c) an electrically conductive pad surrounding said first hole of said via in each of said plurality of wafers for making an electrical connection to electrical circuits located on said first surface of each of said plurality of wafers; and
(d) an electrically conductive compliant material which is located in said via in each of said plurality of wafers which, when not compressed, extends outwardly beyond respective planes of said first and said second holes of said via in each of said plurality of wafers; and
means for stacking a first one of said plurality of wafers on top of a second one of said plurality of wafers such that the compliant material which extends beyond said second hole of said via in said first one of said plurality of wafers will make an electrical contact with said electrically conductive pad surrounding said first hole of said via in said second one of said plurality of wafers and said compliant

material which extends from said first hole of said via in said second one of said plurality of wafers.

4,954,876

HERMETICALLY SEALED COMPRESSION BONDED CIRCUIT ASSEMBLY HAVING FLEXIBLE WALLS AT POINTS OF APPLICATION OF PRESSURE FOR COMPRESSION BONDING CIRCUIT ELEMENTS

Lawrence E. Crowe, Lindenwood, and Thomas A. Sutrina, Rockford, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1988, Ser. No. 226,741
Int. Cl.[5] H01L 23/32
U.S. Cl. 357—76 45 Claims

1. A hermetically sealed circuit assembly containing a plurality of circuit elements which are to be compression bonded upon application of a force applied through opposed first and second walls of a hermetically sealed chamber containing the circuit elements to be compression bonded comprising:

a plurality of circular corrugations within the first wall of the chamber in a spatial configuration with each corrugation determining a spatial location within the circuit assembly for placing a circuit element to be compression bonded;

each of the circuit elements to be compression bonded being axially aligned with a different corrugation in the first wall; and

a plurality of circular corrugations within the second wall of the chamber in a spatial configuration identical to the spatial configuration of the corrugations in the first wall, each corrugation of the second wall respectively being opposed to a corrugation in the first wall, with each pair of opposed corrugations in the first and second walls defining a column with each circuit element to be compression bonded being disposed in a separate column to which the force is to be applied; and

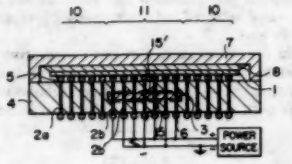
the corrugations of the first and second walls permitting a portion of the wall within each corrugation to flex.

4,954,877

CHIP CARRIER

Keiichirou Nakanishi, Kokubunji; Minoru Yamada, Hanno; Masakazu Yamamoto, Kodaira; Satoru Ogihara; Hiroichi Shinohara, both of Hitachi, and Hideo Suzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 2, 1989, Ser. No. 388,071
Claims priority, application Japan, Sep. 7, 1988, 63-222316
Int. Cl.[5] H01L 39/02
U.S. Cl. 357—80 11 Claims



1. A chip carrier comprising:

a subboard;

at least one LSI chip disposed on said subboard;

signal through-holes disposed only on a first region of said subboard for inputting/outputting signals in/from said chip;

power through-holes disposed only on a second region of said subboard for supplying electric power to said chip; and

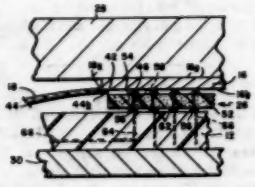
high dielectric constant material disposed on said second region and having a specific dielectric constant higher than that of the material constituting said subboard.

4,954,878

METHOD OF PACKAGING AND POWERING INTEGRATED CIRCUIT CHIPS AND THE CHIP ASSEMBLY FORMED THEREBY

Leslie R. Fox, Boxborough; Paul C. Wade, Shirley, and William L. Schmidt, Acton, all of Mass., assignors to Digital Equipment Corp., Maynard, Mass.

Filed Jun. 29, 1989, Ser. No. 373,960
Int. Cl.[5] H01L 23/02, 23/48, 23/42, 39/02
U.S. Cl. 357—81 24 Claims



1. An IC chip assembly comprising

a chip having an array of exposed contacts at a face thereof;

a substrate having an array of exposed contacts at a face thereof;

interposer means positioned between said chip and substrate, said interposer means including electrically insulating compliant means for providing compliance between said chip and said substrate, said compliant means having first and second opposite surfaces which face said chip and substrate respectively, first exposed contacts at said first surface of the compliant means which engage the contacts on the chip, and second exposed contacts at said second surface of the compliant means which engage the contacts of the substrate;

connecting means electrically connecting said first and second contacts;

thermal transfer means engaging the face of said chip opposite said first face thereof; and

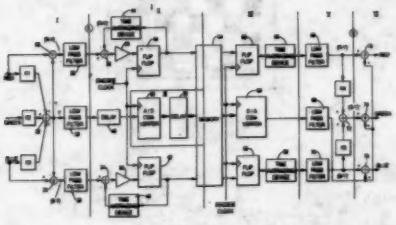
compressing means for compressing said interposer means between said substrate and said thermal transfer means, said interposer means thereby simultaneously providing compliance between said chip and substrate, establishing relatively low inductance electrical connections between the array of chip contacts and the array of substrate contacts and good thermal contact between said chip and said thermal transfer means.

4,954,879

APPARATUS AND METHOD FOR COMPRESSING A VIDEO SIGNAL

Neil W. Heckt, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1988, Ser. No. 287,211
Int. Cl.[5] H04N 7/13
U.S. Cl. 358—13 **4 Claims**



1. An apparatus for compressing a video signal that includes red, green and blue color video signals comprising:

brightness signal generating means, operating in response to the red, green and blue color video signals, for generating a brightness signal according to a first predetermined formula;

difference signal generating means, operating in response to the red, green and blue color video signals and said brightness signal, for generating at least two color difference signals according to a second predetermined formula;

first encoding means for encoding said brightness signal using pulse code modulation;

second encoding means for encoding said at least two color difference signals using differential pulse code modulation;

storage means for storing said encoded brightness signal and said at least two encoded color difference signals;

decoding means for decoding said encoded brightness signals and said at least two encoded color difference signals to produce a decoded brightness signal and decoded color difference signals; and

combining means for combining said decoded brightness signal and said decoded difference signals to form an approximation of the original color video signals.

4,954,880

COLOR DISPLAY APPARATUS

Akihiro Tanimizu, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

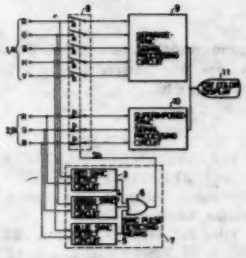
Filed Jun. 22, 1988, Ser. No. 209,832
Claims priority, application Japan, Jun. 25, 1987, 62-97716[U]
Int. Cl.[5] H04N 5/04
U.S. Cl. 358—17 **9 Claims**

1. A color display apparatus comprising:

a first set of a plurality of input terminals for receiving a first set of video signals comprising red, green, and blue video signals, each of said video signals of said first set being applied to a distinct terminal of said first set of input terminals, and for receiving horizontal and vertical synchronizing signals, each of said horizontal and said vertical synchronizing signals being applied to a distinct one of said first set of input terminals, and a second set of a plurality of input terminals for receiving a second set of video signals comprising red, green, and blue video signals, each of said video signals being applied to a distinct terminal of said second set of input terminals, one or more of said video signals of said second set being superimposed with horizontal and vertical synchronizing signals,

a separate-sync signal processing circuit for processing the signals on said first set of input terminals,

a superimposed-sync signal processing circuit for processing said signals on said second set of input terminals,



a detecting means for detecting the presence or absence of superimposed horizontal and vertical synchronizing signals on at least one of said second set of video signals and generating a switching signal,

a switching means for receiving said switching signal and selecting one of said separate-sync signal processing circuit and said superimposed-sync signal processing circuit for processing either said first set of video signals or said second set of video signals, respectively, and

a color display for receiving said first set of video signals or said second set of video signals from either said separate-sync signal processing circuit or said superimposed-sync signal processing circuit, respectively, and displaying an image.

4,954,881

METHOD AND APPARATUS FOR CORRECTING VIDEO COLOR SIGNALS

Michael C. Kaye, Agoura Hills, Calif., assignor to Encore Video, Inc., Hollywood, Calif.

Continuation-in-part of Ser. No. 904,692, Sep. 8, 1986, abandoned. This application Dec. 15, 1987, Ser. No. 159,587
Int. Cl.[5] H04N 9/75, 9/68
U.S. Cl. 358—22 **32 Claims**

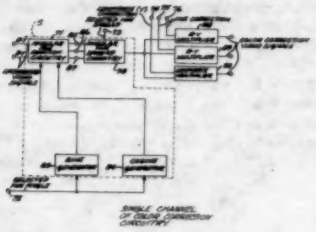
1. A component color correction system for manipulating color signals consisting at least of two color difference signals representing hue and saturation as angle and magnitude in polar coordinates in a chrominance plane, the system comprising:

input means for providing two color difference signals;

color selection means for receiving said two color difference signals, a signal representing a selected hue angle, and a signal representing a selected hue angle, and a signal representing a selected hue spread, and producing a selected signal proportional to the saturation of the color difference signals in the hue region selected by the hue angle and spread signals;

color correction means receiving the selected signal output from the color selection means and correction factors corresponding to each color difference signal independent

of the selected hue angle, and producing correction signals representing the product of the selected signal from the color selection means and the respective correction factor; and



combining means for combining the color difference signals with the respective correction signal to produce corrected color video signals.

4,954,882

COLOR TELEVISION SET HAVING A TELETEXT RECEIVER BUILT-IN

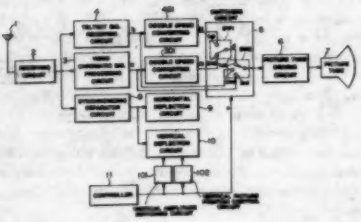
Kazuhiro Kamemoto, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 14, 1989, Ser. No. 380,028

Claims priority, application Japan, Aug. 19, 1988, 63-208602

Int. Cl.[5] H04N *3/22, 5/262*

U.S. Cl. 358—22 **13 Claims**



1. A color television set having a teletext receiver built-in comprising:

a demodulating means receiving television broadcasting electric waves, demodulating the received television video signal and multiplexed teletext signal to primary color signals of R (red), G (green) and B (blue) and reproducing a synchronizing signal;

a double speed converting means time-axially compressing within one horizontal scanning period the television video signal and teletext signal demodulated by said demodulating means;

a switching means including a switch means capable of alternately switching and leading out within one horizontal scanning period the television video signal and teletext signal time-axially compressed by said double speed converting means;

a driving means feeding to a picture tube the output signal from said switching means;

a deflecting means feeding a horizontal deflection current and vertical deflection current to a deflection yoke of the picture tube on the basis of the horizontal and vertical synchronizing signals from said demodulating means and capable of changing a vertical amplitude and vertical picture position with the control of the amplitude and direct current component of the vertical deflection current; and

a control means controlling the switching operation of said switching means and the vertical amplitude change and vertical picture position change of said deflecting means.

4,954,883

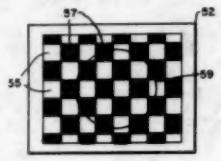
INTERWEAVE PICTURE COMPARISON APPARATUS AND METHOD

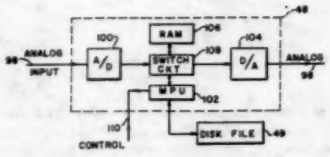
Armand Belmares-Sarabia, Catskill, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 150,626, Feb. 1, 1988, which is a division of Ser. No. 943,298, Dec. 17, 1986, Pat. No. 4,763,186, which is a continuation-in-part of Ser. No. 851,164, Apr. 14, 1986. This application Oct. 14, 1988, Ser. No. 257,647

Int. Cl.[5] H04N *9/76, 5/265*

U.S. Cl. 358—22 **18 Claims**





1. Apparatus for comparing video images, said apparatus comprising, means for receiving video signals representing images in a plurality of different frames of image record media, interweaving the signals representing said different frames in a repetitively alternating pattern, and displaying on a video display device the video pictures formed by said interweaving said video signals being digital and representing individual pixels of the video picture.

11. A method of comparing video images from different frames of image record media, said method comprising the steps of interweaving elements from one of said frames with elements from the other of said frames in a repetitively alternating pattern said elements being formed by individual pixels corresponding to digital video signals said frames having common subject matter to be compared, and comparing the common subject matter from said different frames.

4,954,884

METHOD AND APPARATUS FOR AUTOMATICALLY ADJUSTING WHITE BALANCE

Yoshiaki Nakayama; Kenji Saito, and Yukihiro Kawada, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1988, Ser. No. 290,287

Claims priority, application Japan, Dec. 29, 1987, 62-334866

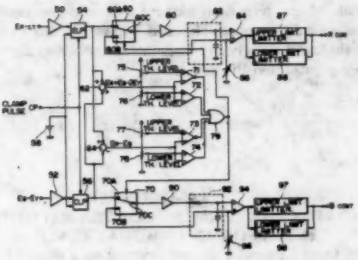
Int. Cl.[5] H04N *9/71*

U.S. Cl. 358—29 **6 Claims**

1. An automatic white balance adjusting method in which color difference signals (E_R-E_Y) and (E_B-E_Y) are respectively produced from signals obtained by photographing an object, said color difference signals are respectively integrated

on the entire screen, and the gains of red and blue signals are controlled such that average values resulting from said integration of said color difference signals can respectively provide predetermined reference levels, said method comprising the steps of :

producing a plurality of color signals including a color signal ($E_R+E_B-2E_Y$) obtained by addition of said two color difference signals in accordance with signals obtained by photographing said object;



setting upper threshold levels and lower threshold levels for removal of chromatic colors respectively according to said respective color signals produced; and,

prohibiting said integration of said respective color difference signals for a period wherein at least one of said color signals goes beyond one of said upper threshold levels or below one of said lower threshold levels to remove the color difference signal that includes a chromatic color.

4,954,885

FILTER FOR SEPARATING LUMINANCE AND CHROMINANCE SIGNALS FROM COMPOSITE COLOR TELEVISION SIGNAL

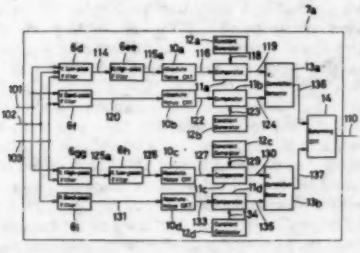
Hiroshi Ito; Tadashi Kasezawa, and Masaharu Yao, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda, Japan

Filed Feb. 25, 1988, Ser. No. 160,332

Claims priority, application Japan, Feb. 25, 1987, 62-43426; Mar. 19, 1987, 62-66855; Mar. 19, 1987, 62-66856; Mar. 19, 1987, 62-66857; Mar. 19, 1987, 62-66858; Mar. 19, 1987, 62-66859

Int. Cl.[5] **H04N** *9/78*

U.S. Cl. 358—31 **5 Claims**



1. A filtering circuit for separating from a composite color television signal both luminance and chrominance signals, comprising:

input terminal means for receiving a composite video signal;

an output terminal;

delay means, operatively connected to said input means, for delaying the composite color television signal;

first filter means, responsive to said composite video signal and the delayed composite video signal, for extracting a chrominance signal corresponding to a frequency component of a color subcarrier in a vertical direction;

second filter means, responsive to at least the delayed composite video signal, for extracting a chrominance signal corresponding to a frequency component of a color subcarrier in a horizontal direction;

third filter means, responsive to said composite video signal, for extracting a chrominance signal corresponding to a frequency component of a color subcarrier in both the vertical and horizontal directions;

determining means, responsive to said composite video signal and the delayed composite video signal, for detecting a correlation of a televised picture in the vertical direction and a correlation of the televised picture in the horizontal direction and for outputting a switching signal; and

switching means, responsive to said switching signal for selecting one of the chrominance signals extracted from either said first, second or third filter means to be supplied to said output terminal;

said composite video signal supplied to the input terminal being sampled at a predetermined frequency synchronized with a horizontal scanning frequency so that sampling points can represent a generally grid-like arrangement on a television screen;

said delay means being utilized to simultaneously give a sampled value of a sampling point of interest at which the luminance signal and the chrominance signal are to be separated and respective sampled values of reference sampling points which linearly align on the television screen with the sampling point of interest in the vertical direction;

said determining means receiving a sampled value of the sampling point of interest and respective sampled values of the reference sampling points from said delay means;

said determining means including,

first detecting means for removing both a direct current component in the vertical direction at the sampling point of interest and a frequency component corresponding to a component of the color subcarrier and for detecting a non-correlated energy in the vertical direction by determining an absolute value thereof,

second detecting means for extracting a frequency component which is low in frequency in the vertical direction at the sampling point of interest and which corresponds to half the frequency of the color subcarrier in the horizontal direction and for detecting the energy of a high frequency luminance signal in the horizontal direction by determining an absolute value thereof,

third detecting means for comparing the non-correlated energy in the vertical direction with a first predetermined value and for comparing the energy of a high frequency luminance signal in the horizontal direction with a second predetermined value,

said third detecting means determining a correlation in the vertical direction when said non-correlated energy in the vertical direction is smaller than said first predetermined value and when the energy of the high frequency luminance signal in the horizontal direction is greater than said second predetermined value,

fourth detecting means for removing both a direct current component in the horizontal direction at the sampling point of interest and a frequency component corresponding to a component of the color subcarrier and for detecting a non-correlated energy in the horizontal direction by determining an absolute value thereof,

fifth detecting means for extracting a frequency component which is low in frequency in the horizontal direction at the sampling point of interest and equal to half the frequency of the color subcarrier in the vertical direction and for detecting the energy of a high frequency luminence signal in the vertical direction by determining an absolute value thereof, and

sixth detecting means for comparing the non-correlated energy in the horizontal direction with a third predetermined value and for comparing the energy of the high frequency luminance signal in the vertical direction with a fourth predetermined value,

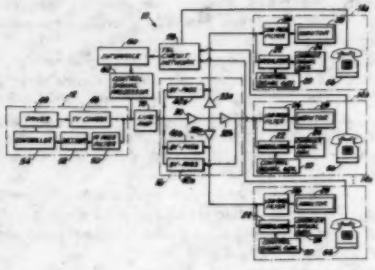
said sixth detecting means determining a presence of the correlation in the horizontal direction when said non-correlated energy in the horizontal direction is smaller than said third predetermined value and when the energy of the high frequency luminance signal in the vertical direction is greater than said fourth predetermined value.

4,954,886

CLOSED CIRCUIT TELEVISION APPARATUS WITH A REMOTE CONTROL TELEVISION CAMERA

David Elberbaum, Tokyo, Japan, assignor to Elbex Video, Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,576
Claims priority, application Japan, Mar. 17, 1988, 63-62042
Int. Cl.[5] H04N *7/10, 7/18*
U.S. Cl. 358—86 **10 Claims**



1. A closed circuit television apparatus comprising:

a remote-controllable television camera including an image pick-up device for generating a video signal;

a plurality of controlling devices each including an operating means for generating a plurality of control signals to control said television camera, and a displaying means for receiving the video signal and displaying a picture corresponding to the received video signal; and

a distributing device for connecting said displaying means of the respective controlling devices to the television camera to distribute the video signal outputted from said television camera to the respective controlling devices;

said operating means including a circuit for generating a plurality of composite signals each composed of two signals having different frequencies commensurate with the kind of control, a circuit for generating a carrier signal having a frequency higher than the frequency of the video signal, and a circuit for modulating the carrier signal by the composite signal, and outputting the control signals to a circuit portion connecting said distributing device to said displaying means;

said television camera further including a driving means for receiving the control signals, said driving means including a filter for extracting a modulated carrier signal outputted from said driving means, a decoder for demodulating the composite signal from the extracted signal and for outputting a signal corresponding to a demodulated signal, a driver for actuating said television camera, and a controller for controlling said driver based on the signal outputted from said decoder;

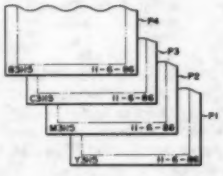
said distributing device including a main circuit portion connected to a transmission line, a plurality of branching circuit portions branching off from said main circuit portion and individually connected to said displaying means, at least one processing circuit having input and output terminals and disposed in one of said main circuit portion and said branching circuit portions, so that the input and output terminals of said processing circuit are disposed at a television camera side and a controlling device side, respectively, said processing circuit outputting the video signal and preventing the control signals from being outputted therefrom, and a plurality of bypass circuits having input and output terminals and connecting across said main circuit portion and said branching circuit portions so as to bypass said processing circuit, so that the input and output terminals of said bypass circuits are disposed at each of the television camera side and the controlling device side, respectively, said bypass circuits outputting the control signals and preventing the video signal from being outputted therefrom.

4,954,887

APPARATUS FOR FORMING COLOR GRAPHIC ARTS FILMS FOR AN ORIGINAL PLATE

Kenichi Ono, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 318,505, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 73,227, Jul. 14, 1987, abandoned. This application Jul. 19, 1989, Ser. No. 382,022
Claims priority, application Japan, Jul. 22, 1986, 61-172256
Int. Cl.[5] H04N *1/387*
U.S. Cl. 358—75 **10 Claims**



1. An apparatus for forming color graphic arts films for an original plate, said apparatus comprising:

means for outputting image forming signals of different colors corresponding to an original image;

means for designating a plurality of pieces of color information corresponding to the image forming signals outputted by said outputting means;

means for feeding a color transfer member having a color agent corresponding to at least one of the pieces of color information designated by said designating means;

means for supplying a predetermined number of plastic films;

means for inputting control information so as to control by identification color graphic arts films, said control information including at least color information of each of the colors corresponding to said plurality of pieces of color information designated by said designating means; and

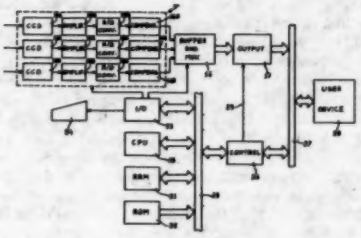
means for forming the color graphic art films, each having the original image which is formed on the basis of one of the image forming signals of different colors outputted by said outputting means and a control image which is formed on the basis of the control information inputted by said inputting means, by transferring the color agent of said color transfer member fed by said feeding means onto the plastic films supplied by said supplying means in accordance with the designation of said designating means, the control image being formed at a predetermined position on each of the plastic films at the same time as the original image is formed on each of the plastic films.

4,954,888

APPARATUS FOR READING AND DIGITAL PROCESSING OF COLOR IMAGES

Giuseppe Fogaroli, Ivrea; Giuseppe Coli, Chiaverano; Giorgio Tadini, Corso Giovanni Pascoli, and Giampiero Meazza, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S. p. A., Ivrea, Italy

Filed Feb. 6, 1989, Ser. No. 309,085
Claims priority, application Italy, Mar. 18, 1988, 67232 A/88
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 12 Claims



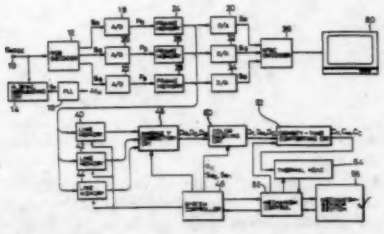
1. An apparatus for reading and digital processing of colour images comprising a group of pluralities of elements (11G, 11R, 11B) for reading the individual pixels associated with the primary colours of the image for generating corresponding reading signals, and comprising reading mode selection means (36, C) for selection for monochrome output the reading signal generated by a predetermined one (11G) of said pluralities of elements characterised in that the group of pluralities of elements (11G, 11R, 11B) is operable to control a colour indication circuit (47) for indicating the presence of any colour in the image, the selection means (36) being capable of enabling that circuit to output the colour indication in association with the reading signal generated by the predetermined one plurality of elements (11G).

4,954,889

COLOR MASKING CIRCUIT AND COLOR VIDEO PRINTER USING THE SAME

Kunio Endo, and Tadashi Katsukawa, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan

Continuation of Ser. No. 188,464, Apr. 29, 1988, abandoned.
This application Nov. 30, 1989, Ser. No. 443,880
Claims priority, application Japan, Apr. 30, 1987, 62-106940; Jun. 30, 1987, 62-162643
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—80 4 Claims



2. A color masking circuit in a color printer for performing color masking processing upon density data indicating the density of color picture elements, comprising:

input means for receiving density data in the form of parallel input data;

at least one look-up table in which matrix operation values for masking according to possible values of said density data are stored at predetermined addresses, said matrix operation values compensating for colors of color materials used in said color printer; and

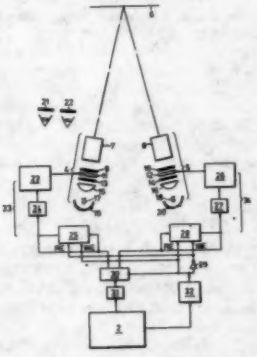
output means for outputting a selected matrix operation value as desired output density data corresponding to said density data, said density data being used as an address to said at least one look-up table to select said selected matrix operation value.

4,954,890

DRIVING METHOD FOR 3-D HIGH LUMINANCE LCD PROJECTOR

Hong C. Park, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Oct. 27, 1988, Ser. No. 263,639
Claims priority, application Rep. of Korea, Oct. 31, 1987, 1987/12246
Int. Cl.[5] H04N *15/00*
U.S. Cl. 358—88 11 Claims



1. In a 3-D image system employing a signal source for sequentially generating signals and alternately directing the sequentially generated signals to left and right image systems respectively, said image systems comprising left and right LCD projectors respectively for projecting images corresponding to the signals received onto a screen, a driving method for achieving high luminance 3-D with said projectors, said method comprising the steps of: projecting an image corresponding to a generated signal received by a selected one of the left and right image systems; memorizing the signal received by the selected image system; projecting by the other of said left and right image systems an image corresponding to the next sequentially generated signal and simultaneously projecting by the previously selected image system an image corresponding to the memorized signal such that one of the left and right image systems gives a present image signal, while the other of the left and right image systems gives again the memorized image just prior displayed, onto the screen by means of two respective light sources to upgrade the luminance of the 3-D image on the screen.

4,954,891

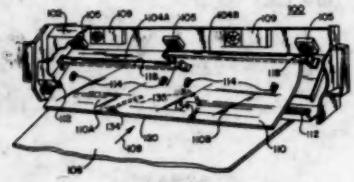
LIGHT GUIDED ILLUMINATING/SECTIONING DEVICE FOR SHEET INSPECTION SYSTEM

Gary N. Burk, Columbus; Thomas O. McCanney, Sunbury, and Paul Williams, Columbus, all of Ohio, assignors to Process Automation Business, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 217,395, Jul. 11, 1988, abandoned. This application Jan. 23, 1989, Ser. No. 300,089

Int. Cl.[5] H04N 7/18

U.S. Cl. 358—101 25 Claims



1. A light source module for use with a multi-camera array in inspecting a moving sheet of material, said light source module comprising:

first light emitter means for emitting light in response to applied power, said first light emitter means extending lengthwise across the entire width of a sheet to be inspected as measured in a direction transverse to the direction of sheet movement;

housing means supporting said first light emitter means which is secured thereto, said housing means extending lengthwise across a distance greater than the entire width of a sheet to be inspected; and

light guide means secured to said housing means for receiving light from said first light emitter means and for guiding the received light toward a sheet to be inspected such than the sheet is illuminated over a portion thereof extending across its entire width, said light guide means having a light receiving surface facing said first light emitter means for direct reception of light therefrom and a light ejecting surface facing the sheet.

4,954,892

BUFFER CONTROLLED PICTURE SIGNAL ENCODING AND DECODING SYSTEM

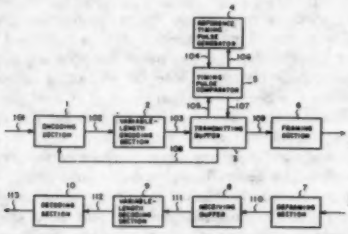
Kohtaro Asai; Tokumichi Murakami, and Kazuhiro Matsuzaki, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 416,984

Claims priority, application Japan, Feb. 14, 1989, 64-34344; Feb. 14, 1989, 64-34345

Int. Cl.[5] H04N 7/12

U.S. Cl. 358—133 2 Claims



1. A picture signal encoding and decoding apparatus having an encoding section for converting a series of picture elements whose number is predetermined (one picture frame or one line etc.) of a digitized picture signal series to a variable-length code-word series for transmission; and a decoding section for receiving a transmitted encoded signal and converting the signal to a fixed-length signal and after that decoding the signal to a digital picture signal series;

said picture signal encoding and decoding apparatus comprising:

a transmitting buffer for performing speed conversion by storing data temporarily in order to transmit a sequence of said variable-length code-word series at a constant transmission rate;

a reference timing pulse generator being able to create reference timing pulses having an adjustable fixed period; and

a timing comparing and adjusting section for sensing the timing of head timing pulses positioned at the head of each of said variable-length coded-word series corresponding to said series of picture elements whose number is predefined which are read from said transmitting buffer and for determining the time difference between said head timing pulses and said reference timing pulses, and if said reference timing pulse is found to occur later than said head timing pulse, the magnitude of the time difference between said reference timing pulse and said head timing pulse is determined, and if the magnitude of said time difference is larger than a predetermined threshold value, the reading from said transmitting buffer is stopped and, after the insertion of dummy data, is then resumed to compensate for said time difference, and if said reference timing pulse is found to occur earlier than said head timing pulse, said reference pulse generator is reset to effect time adjustment to correct for the time difference between said reference timing pulse and head timing pulse whereby encoded-data series to be transmitted can be adjusted time-serially based on the reference timing given by said reference timing generator.

4,954,893

REFERENCE SIGNAL PRODUCING CIRCUIT FOR PHASE SERVO CONTROL

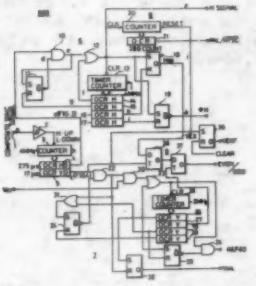
Toyozo Urakami, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 7, 1989, Ser. No. 404,015

Claims priority, application Japan, Sep. 7, 1988, 63-224037; Jan. 31, 1989, 1-22941

Int. Cl.[5] H04N 5/04, 5/10

U.S. Cl. 358—148 16 Claims



1. A reference signal producing circuit for producing a reference signal based on a composite synchronizing signal externally supplied, comprising:

means (3, 5) for separating a synchronizing signal from said composite synchronizing signal;

first timer means (25) reset by said reference signal;

first compensation signal producing means (26) for comparing an output of said first timer means with a variable set

value and producing a first compensation signal having a variable period;

reference signal output means (23) for supplying as said reference signal an output of said synchronizing signal separating means or an output of said first compensation signal producing means; and

means for changing said set value of said first compensation signal producing means such that the period of said first compensation signal is normally set to a value larger than the value of a synchronizing signal period while being set to a value equal to the synchronizing signal period in the case that a predetermined number of or more of the synchronizing signal pulses within said composite synchronizing signal lack successively.

4,954,894

RECURSIVE NOISE-REDUCER

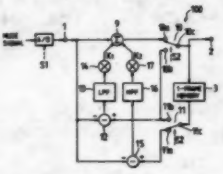
Masahiro Kitaura, Nagareyama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 13, 1989, Ser. No. 322,483

Claims priority, application Japan, Mar. 14, 1988, 63-60116

Int. Cl.[5] H04N *5/21*

U.S. Cl. 358—167 **4 Claims**



1. A recursive noise-reducer comprising:

first switch means for performing an interframe interpolation process on an input digital signal to thereby convert the input digital signal into an interpolated signal;

memory means having a capacity equal to one frame of the interpolated signal;

second switch means for outputting from the memory means a one-frame-preceding interpolated signal component of the input digital signal and a two-frame-preceding interpolated signal component of the input digital signal;

first subtracting means for deriving a difference between the input digital signal and the one-frame-preceding interpolated signal component;

a first filter means for filtering an output signal from the first subtracting means and for passing a signal component having a recursion with a period corresponding to one frame;

a first multiplier means for multiplying an output signal from the first filter means by a predetermined first coefficient;

second subtracting means for deriving a difference between the input digital signal and the two-frame-preceding interpolated signal component;

a second filter means for filtering an output signal from the second subtracting means and for passing a signal component having a recursion with a period corresponding to two frames;

a second multiplier means for multiplying an output signal from the second filter means by a predetermined second coefficient; and

and adder for adding the input digital signal, and output signal from the first multiplier means and an output signal from the second multiplier means;

wherein the first switch means alternately selects an output signal from the adder and the one-frame-preceding interpolated signal component to thereby generate the interpolated signal with reduced noise components.

4,954,895

SOLID-STATE IMAGING DEVICE INCLUDING PHOTOELECTRIC CONVERSION ELEMENTS INTEGRATED AT A SURFACE OF A SEMICONDUCTOR SUBSTRATE

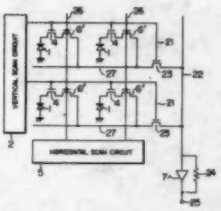
Hajime Akimoto, Hachioji, and Shinya Ohba, Kanagawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 278,844

Claims priority, application Japan, Dec. 4, 1987, 62-305637

Int. Cl.[5] H04N *3/14*

U.S. Cl. 358—213.11 **13 Claims**



1. A solid state imaging device comprising:

a plurality of photoelectric conversion elements disposed at a surface of a semiconductor substrate of a first conductivity type in a matrix configuration, for storing signal charges corresponding to incident light;

first signal lines for transferring said signal charges on said photoelectric conversion elements aligned in a predetermined direction line, along said predetermined direction;

first switch means for transferring said signal charges stored in said photoelectric conversion elements to said first signal line, the first switch means having at least one MOS type transistor formed substantially in a transmission path of said incident light to an associated photoelectric conversion element;

a second signal line for transmitting said signal charges from said first signal lines to an output terminal;

second switch means for transferring said signal charges on said first signal lines to said second signal line; and

scan means for scanning said first and second switch means in a predetermined order.

4,954,896

ELECTRONIC PROJECTOR SYSTEM SUCH AS A HIGH DEFINITION TELEVISION (HDTV) PROJECTION TELEVISION SYSTEM OR THE LIKE HAVING A FLUID THEREIN WITH INCREASED RESISTANCE TO DAMAGE FROM PROJECTION SYSTEM RADIATION

Stefan Mayer, and Susanne Schmidt, both of Berlin, Fed. Rep. of Germany, assignors to Heinrich-Hertz-Institut für Nachrichtentechnik Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Feb. 1, 1990, Ser. No. 473,314

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3904264

Int. Cl.[5] H04M *5/74*

U.S. Cl. 358—234 **21 Claims**

1. A television (HDTV) projection system or the like, said system comprising:

a container;

said container having a coating disposed therein;

said coating having an electrostatically deformable dimension;

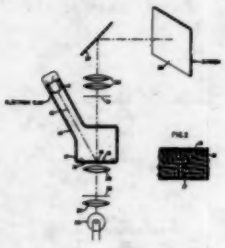
electron beam means for producing an electrical charge on at least said coating as a function of an applied electrical signal and cooperating with said interior to subject said coating to a deforming force to produce deformations in said coating;

a source of radiant energy:

said source of radiant energy being disposed to provide radiant energy to said coating;

an optical system for projecting radiant energy from said source of radiant energy as a function of the deformations in said coating;

said optical system being disposed for projecting radiant energy from said source of radiant energy to said coating;



said coating comprising a fluid containing an organic basic material and at least one organic additive;

said fluid being at least a part of said dielectric coating with said electrostatically deformable dimension;

said at least one additive comprising an oligo(-phenylenemethylene) resorcinol; and

said optical system for projecting radiant energy for forming an image.

4,954,897

ELECTRONIC STILL CAMERA SYSTEM WITH AUTOMATIC GAIN CONTROL OF IMAGE SIGNAL AMPLIFIER BEFORE IMAGE SIGNAL RECORDING

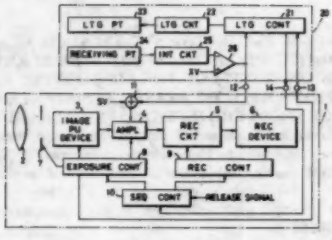
Satoshi Ejima, Tokyo, and Tetsuya Yamamoto, Hasuda, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 194,897, May 17, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,865

Claims priority, application Japan, May 22, 1987, 62-125641

Int. Cl.[5] H04N *5/238*

U.S. Cl. 358—228 **7 Claims**



1. An electronic still camera comprising:

an optical system for forming an image of an object from light from the object;

image pickup means for accumulating charges corresponding to the image of the object and thereby producing an image signal;

amplifier means for amplifying said image signal;

recording means for recording said image signal from said amplifier means on a recording medium;

flash means for emitting a flash of light toward the object substantially simultaneously with the start of charge accumulation of said image pickup means;

generating means for generating a photoelectric signal corresponding to the intensity of light from said object;

integration means for integrating said photoelectric signal and producing an integration signal corresponding to the result of said integration, said integration means initiating the integration of said photoelectric signal substantially simultaneously with the start of charge accumulation of said image pickup means;

comparator means for comparing the value of said integration signal with a reference value and producing a comparison signal corresponding to the difference between the value of said integration signal and said reference value; and

gain adjusting means, dependent upon said comparison signal, for adjusting the gain of said amplifier means substantially upon termination of charge accumulation of said image pickup means before recording said image signal on the recording medium.

4,954,898

WIPE PATTERN GENERATOR

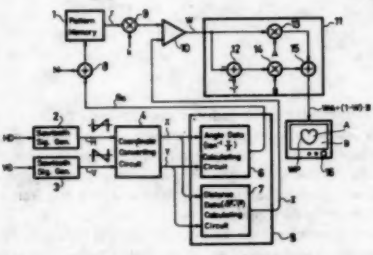
Tetsuro Nakata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 1, 1989, Ser. No. 345,229

Claims priority, application Japan, May 7, 1988, 63-110743; May 17, 1988, 63-120234; Jun. 14, 1988, 63-146211

Int. Cl.[5] H04N *5/272, 7/01, 9/64*

U.S. Cl. 358—183 **14 Claims**



1. A wipe pattern generator for generating a wipe pattern signal on the basis of stored wipe pattern data for displaying video signals on a display screen, comprising:

(a) memory means for storing data expressed in polar coordinates to indicate a contour of a wipe pattern;

(b) pixel position designating means for generating angle data and distance data indicating a position of each pixel of said display screen in a polar coordinate system; and

(c) means for forming a wipe pattern signal on the basis of data indicating a contour of said wipe pattern derived from said memory means based on said angle data and said distance data.

4,954,899

RECEPTION CONTROL APPARATUS FOR A TELEVISION RECEIVER

Toshiyuki Tanabe, and Seiji Senoo, both of Saitama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 1, 1988, Ser. No. 200,970

Claims priority, application Japan, Jun. 2, 1987, 62-139303

Int. Cl.[5] H04N *5/50*; H04B *1/16*

U.S. Cl. 358—191.1 **8 Claims**

1. A channel selection apparatus used for a television receiver, comprising:

power means for providing power to the channel selection apparatus;

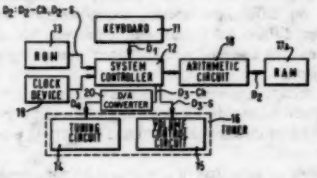
input means for receiving channel selection data corresponding to a channel which the television receiver is currently

receiving, and for outputting reception control data in accordance with the channel selection data;

clock means for generating successive current time data;

memory means for storing said reception control data supplied from the input means for a predetermined period together with a first one of said current time data corresponding to the predetermined period and to the reception control data to be stored;

means for controlling the memory means for writing said



reception control data and said corresponding time data to the memory means and for reading out from the memory means reception control data and time data corresponding to a second one of said current time data, said clock means generating the second current time data at a time when said power means begins to provide power to the channel selection apparatus; and

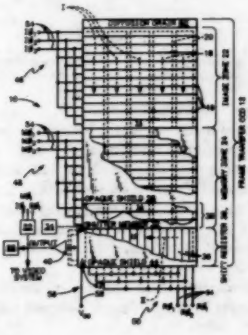
output means responsive to the controlling means for receiving the reception control data read out from the memory means.

4,954,900

IMAGING AND WIDE SECTOR SEARCHING APPARATUS

Wayne W. Frame, Longmont, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jan. 6, 1989, Ser. No. 294,195
Int. Cl.[5] H04N *3/15*
U.S. Cl. 358—213.26 **20 Claims**



1. An apparatus comprising:

first means for receiving radiation and generating first output as a function of the amount of radiation received during a predetermined time period;

second means for receiving and storing said first output from said first means during a first mode of operation, and for receiving radiation and generating a second output as a function of the amount of radiation received during a second mode of operation; and

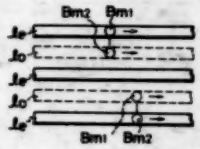
third means for transmitting one of said first output and said second output for processing.

4,954,901

TELEVISION RECEIVER WITH TWO ELECTRON BEAMS SIMULTANEOUSLY SCANNING ALONG RESPECTIVE VERTICALY SPACED APART LINES

Takashi Okada, Kanagawa, and Atsushi Matsuzaki, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,561
Claims priority, application Japan, Feb. 15, 1983, 58-23168; Feb. 16, 1983, 58-23998
Int. Cl.[5] H04N *5/68, 9/20*
U.S. Cl. 358—242 **10 Claims**



1. A television receiver for providing a non-interlaced display of a received television signal intended for interlaced display comprising:

a cathode ray tube having first and second cathodes, control grids and a fluorescent screen;

means responsive to the received television signal for applying a first video signal to said first cathode such that said first cathode emits a first electron beam in response to said first video signal;

means responsive to said first video signal for applying to said second cathode a second video signal determined at least in part by said first video signal such that said second cathode emits a second electron beam in response to said second video signal simultaneously with the emanation of said first electron beam from said first cathode;

deflection means for horizontally and vertically deflecting said first and second electron beams from said first and second cathodes simultaneously so that each of said beams scans said screen along a respective pattern of vertically spaced, substantially horizontal scanning lines; and

deflection compensating means provided between said first and second cathodes and said fluorescent screen for making said second electron beam impinge upon said fluorescent screen between said scanning lines of said first electron beam such that said second electron beam forms a visual display spaced ½ line interval apart from a visual display simultaneously formed by said first electron beam.

4,954,902

TRACKING CONTROL METHOD AND DEVICE IN ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING APPARATUS

Takashi Furuhata, and Kenji Satoh, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 932,377, Nov. 20, 1986, abandoned. This application Apr. 10, 1989, Ser. No. 336,620
Claims priority, application Japan, Nov. 20, 1985, 60-258528
Int. Cl.[5] G11B *15/00*
U.S. Cl. 360—10.2 **15 Claims**

1. A tracking control device for use in a rotary head magnetic recording/reproducing apparatus in which information signals are recorded on a magnetic tape and reproduced therefrom by rotary magnetic head means comprising:

pulse generator means for generating pulse signals in synchronism with the rotation of said magnetic heads;

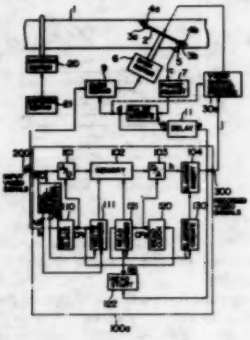
a memory with a predetermined storage capacity for temporarily storing said information signal;

means for successively writing said information signals in the memory;

means for successively reading said information signals

written in the memory in synchronism with the pulse signals from said pulse generator means and outputting them together with predetermined synchronizing information to successively record them on the slanting tracks of said magnetic tape by said magnetic head means;

a synchronizing information output circuit for separating said synchronizing information from the signals reproduced by scanning the recording tracks of said magnetic tape by said magnetic head means, thereby outputting pulses;



reference pulse creation means for creating reference pulses in synchronism with the pulse signals from said pulse generator means;

phase comparator means for phase-comparing the output pulses from said synchronizing information output circuit with the output pulses from said reference pulse creation means to output signals in accordance with the phase difference therebetween; and

control means for controlling said magnetic head means, in response to the outputs from said phase comparator means, so that said magnetic head means can properly scan the recording tracks.

4,954,903

DIGITAL SIGNAL REPRODUCTION APPARATUS FOR READING MAGNETO-OPTICAL DISKS

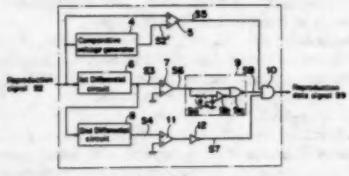
Hiroshi Fuji; Takeshi Yamaguchi; Kunio Kojima; Toshihisa Deguchi; Shigeo Terashima, and Tsuneo Fujiwara, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1988, Ser. No. 245,771

Claims priority, application Japan, Sep. 21, 1987, 62-236757; Oct. 27, 1987, 62-270607

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—46 **3 Claims**



1. A digital signal reproduction apparatus for reproducing data from a magneto-optical disk, comprising:

comparative voltage generating means for generating a comparative voltage according to a reproduction signal reproduced from the magneto-optical disk;

first comparing means, operatively connected to said comparative voltage generating means, for comparing said reproduction signal with said comparative voltage and for outputting a first window signal according to the comparison;

first differential means, operatively connected to said first comparing means, for differentiating said reproduction signal and outputting a first order differential signal;

second differential means, operatively connected to said first differential means, for differentiating said first order differential signal and outputting a second order differential signal;

second comparing means, operatively connected to said second differential means, for comparing said second order differential signal with a predetermined level and outputting a second window signal according to the comparison;

peak detecting means, operatively connected to said first differential means, for detecting a zero-cross point in said first order differential signal and outputting a peak detecting signal; and

gate means, operatively connected to said peak detecting means and said first and second comparing means, for gating said peak detecting signal with said first and second window signals and outputting a reproduction data signal substantially without influence from noise.

4,954,904

METHOD AND APPARATUS FOR PREVENTING HEAD CRASHES IN A DISK SYSTEM

Dan Goor, Colorado Springs, Colo., assignor to Goor Associates, Inc., Colorado Springs, Colo.

Division of Ser. No. 125,000, Nov. 24, 1987, Pat. No. 4,814,907.

This application Dec. 13, 1988, Ser. No. 283,838

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[5] G11B *21/21*

U.S. Cl. 360—75 **6 Claims**

1. A disk system including means for preventing the corruption of stored information comprising:

a platter having a substantially planar first surface;

a layer of material disposed on said platter first surface for storage of data, said layer having an inner surface adjacent said platter first surface and an outer surface;

means for reading data stored on said layer, said reading means having a lower surface;

means for supporting said reading means such that said reading means lower surface is adjacent said layer outer surface;

first means associated with said reading means for providing a magnetic field of a preselected polarity substantially perpendicular to said platter first surface;

second means associated with said platter for providing a magnetic field substantially perpendicular to said platter first surface, said second means opposing said first means and having its polarity selected such that said first means exerts a repelling force on said second means; and

said first and second means for providing a magnetic field being cooperative to prevent the lower surface of said reading means from contacting said layer outer surface via magnetic repulsion.

4,954,905

DATA TRANSDUCER POSITION CONTROL SYSTEM FOR DISK STORAGE DRIVE SYSTEM

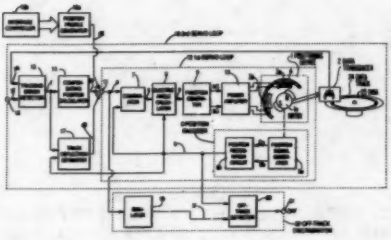
Noriaki Wakabashi, Hirakata; Shuichi Yoshida, Osaka; Toshio Inaji, Minou; Hiromi Onodera, Nara; Tsukasa Yoshiura, Katano, and Hiroshi Mitani, Daito, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1988, Ser. No. 290,187

Claims priority, application Japan, Dec. 24, 1987, 62-328535; Mar. 29, 1988, 63-75460

Int. Cl.[5] G11B 5/596

U.S. Cl. 360—77.03 53 Claims



1. A data transducer position control system for data disk storage drive system having a data transducer adapted to write and/or read information data to and/or from a plurality of data tracks provided on the surface of a data disk, comprising:

a positioning device for moving the data transducer on the disk surface;

position encoder means for producing a current position signal indicating the current position of the positioning device upon detecting the displacement of movement of the same;

comparator means for producing a deviation signal in correspondence with the deviation of the current position signal supplied from the position encoder from a reference position signal;

electric angle calculator means for calculating an electric angle signal in relation to the deviation for input power to the positioning device;

function generator means for producing plural phase signals, which are different from each other in phase, in accordance with the electric angle signal;

a power amplifier for feeding an electric current to each of plural windings in the positioning device after amplifying their respective plural phase signals;

first servo loop means including the positioning device, position encoder, comparator means, electric angle calculator means, and power amplifier so as to constitute a closed loop servo system;

tracking error detector means for producing a tracking error signal upon detecting the position error occurring between the data transducer and the data track;

compensating position calculator means for calculating the reference position signal in relation to the tracking error signal; and

second servo loop means including the tracking error detector means and compensating position calculator means so as to constitute a closed loop servo system.

4,954,906

POSITION CONTROL SYSTEM FOR A MAGNETIC STORAGE DEVICE USING A SMALL SIZED DISK

Yoshihiro Nakamura; Kazuya Takahashi; Atsuki Ichinose, and Testuya Mino, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

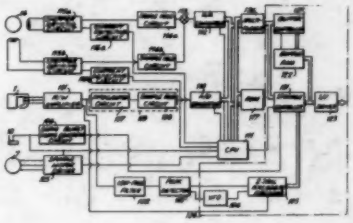
PCT No. PCT/JP87/00132, § 371 Date Nov. 4, 1987, § 102(e) Date Nov. 4, 1987

PCT Filed Mar. 3, 1987, Ser. No. 116,293

Claims priority, application Japan, Mar. 4, 1986, 61-46713; Apr. 1, 1986, 61-74796; Apr. 1, 1986, 61-74800; Apr. 30, 1986, 61-100164

Int. Cl.[5] G11B 5/596, 21/10

U.S. Cl. 360—77.08 11 Claims



6. A position control system for a magnetic storage device having at least one magnetic disk, comprising at least one magnetic head for writing data on or reading data from said disk, a spindle, said disk being mounted on said spindle, a spindle motor for rotating said disk, an actuator for moving said magnetic head in a radial direction of said disk, comprising;

a step motor for moving said actuator;

a constant current driving means for outputting a current which corresponds to an input voltage for exciting each phase of said step motor;

a current detecting means for detecting the driving current output by said constant current driving means and producing an output in response thereto;

a D/A converter for applying the voltage input to said constant current driving means in response to a digital input;

a means for detecting the beginning of the current flowing in said constant current driving means in accordance with the output of said current detecting means and increasing the value of said D/A converter from zero by increments of one to produce a digital offset value, further maintaining the resulting digital offset value when current flows in said constant current driving means; and

an amendment means for outputting the voltage obtained by adding said digital offset value of said D/A converter to said driving means.

4,954,907

HEAD POSITIONING CONTROL METHOD AND SYSTEM

Kazuyuki Takita, Hachiohji, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,588

Claims priority, application Japan, Aug. 6, 1987, 62-195436

Int. Cl.[5] G11B 5/55

U.S. Cl. 360—78.07 5 Claims

1. A head positioning control system for use in a data recording disk file of the type wherein a head is connected to a current-driven head driving means and wherein servo information on the disk is sampled to provide head position information, the system comprising:

a velocity means for measuring the velocity of a head;

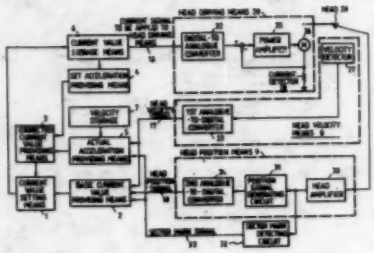
a position means for detecting the position of the head;

a velocity storage means for storing the previous measured velocity of the head;

a current value storage means for storing the current value to be applied to the head driving means;

means for determining a basic current value from the measured velocity and the detected position at the present sampling;

means for providing an actual acceleration of the head, said actual head acceleration providing means including means for determining the difference between the measured velocities of the head at the present and previous samplings;



means coupled to the current value storage means for determining a set acceleration of the head from the current value stored in said current value storage means;

means for providing a corrected current value, said corrected current value providing means including means for determining the difference between the actual acceleration and the set accelerations; and

means coupled to the current value storage means for determining, from the basic current value and the corrected current value, a current value for the head current value storage means.

4,954,908

RECORD MEDIUM CONTROL APPARATUS

Masaharu Sengoku, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

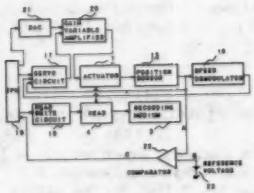
Filed Oct. 17, 1988, Ser. No. 258,897

Claims priority, application Japan, Dec. 14, 1987, 62-317827

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] G11B *33/00*; G05B *1/06*

U.S. Cl. 360—78.04 **3 Claims**



1. A storage apparatus comprising,

a head which records information on a recording medium, or regenerates information from the recording medium;

a servo mechanism having a position sensor for detecting the position of said head, an actuator for moving said head, and a servo circuit for driving said actuator to set said head to a proper position in response to an output signal from said position sensor;

a gain-variable amplifier disposed between said servo circuit and said actuator;

a gain controlling means for outputting a signal for varying the gain of amplification of said gain-variable amplifier;

a reference voltage generating means for generating a reference voltage;

a comparator which compares said reference voltage with the output signal of said position sensor; and

a gain margin detecting means for detecting a gain margin of said servo mechanism in response to a variance in an output signal of said comparator in varying the gain of amplification of said gain-variable amplifier,

wherein said gain controlling means comprises a computer which outputs a positioning command to said servo circuit and outputs a read/write command to said head.

4,954,909

DATA MEMORIZING DEVICE WHICH DETERMINES THE MOVEMENT OF THE RECORDING HEAD

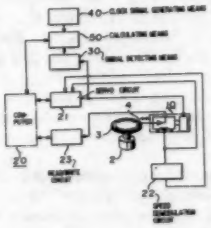
Masaharu Sengoku, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 152,497, Feb. 5, 1988, abandoned. This application Jan. 3, 1990, Ser. No. 462,350

Claims priority, application Japan, May 13, 1987, 62-117411

Int. Cl.[5] G11B *5/55, 21/08*

U.S. Cl. 360—78.04 **2 Claims**

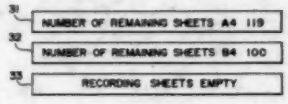


1. A data memorizing device comprising a rotatable disk-like recording medium carrier, a magnetic head placed near a recording surface of said recording medium carrier and an actuator which supports said magnetic head and is driven by an instruction signal given by an outer device to move said magnetic head so as to traverse said recording surface so that said magnetic head is brought to a predetermined position on said recording surface, characterized in that said data memorizing device comprises a digital signal generating means for generating a digital signal consisting of two logical values of a high level value and a low level value which respectively correspond to a set amount of movement and the stop of said actuator; a signal detecting means for detecting said digital signal; a clock signal generating means for generating a clock signal having pulses of a predetermined frequency; and a calculating means which receives said clock signal and digital signal and which outputs a pulse signal having a predetermined value by counting the pulses of said clock when said digital signal takes the high level logical value and when said counted pulses equal a predetermined number, and resets the counting operation when said digital signal takes the low level logical value.

4,954,910
RECORDER DISPLAYING RECORDING SHEET QUANTITY AVAILABLE ON REMAINING WEB SHEET SUPPLY

Yasuhide Ueno, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,130
Claims priority, application Japan, Oct. 2, 1987, 62-250442
Int. Cl.[5] H04N *1/23*; G01D *15/10*
U.S. Cl. 358—296 6 Claims

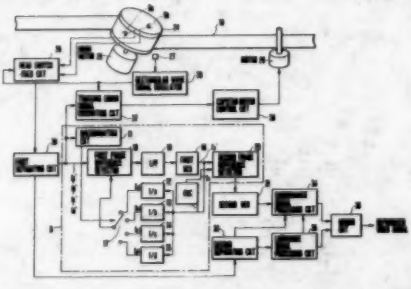


1. A recorder comprising:
record means for recording data on a web recording sheet;
detection means for detecting an amount of remaining recording sheet; and
output means for outputting information on the number of pages remaining for recording in accordance with the amount of remaining recording sheet detected by said detection means and a size of the image to be recorded.

4,954,911
REPRODUCING APPARATUS HAVING A MECHANISM FOR COMPENSATING TIME-BASE FLUCTUATIONS

Masahide Hirasawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 166,769, Mar. 4, 1988, abandoned, which is a continuation of Ser. No. 805,960, Dec. 5, 1985, abandoned. This application Dec. 8, 1989, Ser. No. 453,062
Claims priority, application Japan, Dec. 7, 1984, 59-257332; Mar. 15, 1985, 60-50628
Int. Cl.[5] H04N *9/89*
U.S. Cl. 358—323 15 Claims

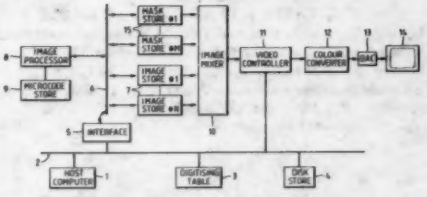


1. A reproducing apparatus for reproducing a recording form a record bearing medium on which a plurality of different pilot signals having different frequencies are recorded in rotation along with an information signal, one in each of recording tracks of said record bearing medium in a predetermined sequence, comprising:
(a) reproducing means for reproducing signals recorded in each of said recording tracks formed on said record bearing medium;
(b) converting means for converting said pilot signals which are reproduced by said reproducing means including a time-base fluctuation component therein into one frequency signal including said time-base fluctuation component;
(c) reference signal generating means for generating a reference signal;
(d) comparison means arranged to compare said reference signal produced from said reference signal generating means with a signal produced from said converting means to obtain a comparison signal; and
(e) eliminating means for eliminating said time-base fluctuation component of said information signal reproduced by said reproducing means in accordance with said comparison signal produced from said comparison me ns.

4,954,912
IMAGE GENERATING APPARATUS

Lindsay MacDonald, Bedfordshire; Clive Mayne, and Reza P. Rassool, both of London, all of England, assignors to Crosfield Electronics Limited, London, England

Filed May 31, 1989, Ser. No. 359,299
Claims priority, application United Kingdom, May 31, 1988, 8812891
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—448 7 Claims

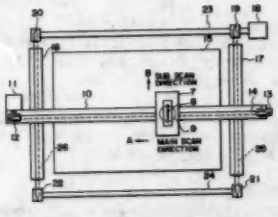


1. Apparatus for generating a composite image from a plurality of subsidiary images, the apparatus comprising:
first storage means for storing signals representing at least two subsidiary images;
second storage means for storing at least two arrays of mask data, each array having a mask pixel corresponding to each pixel of the composite image; and
control means responsive to each array of mask data to genera.e for the pixels of the composite image signals defining a weighted sum of the subsidiary images, wherein the control means includes a number of image mixing stages connected in cascade, each of which is associated with a mask data array, each stage downstream of the first combining two input pixel signals, one from the output of the previous stage and the other from a subsidiary image in the first storage means.

4,954,913
IMAGE READING APPARATUS

Koji Kajita, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 299,451
Claims priority, application Japan, Jan. 29, 1988, 63-018809; May 20, 1988, 63-123680
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—474 18 Claims



1. An image reading apparatus comprising:

reading means for reading an image line by line and outputting image data;

first moving means for repeatedly moving a reading position of said reading means in a main scanning direction a plurality of times;

second moving means for moving the reading position of said reading means in a subscanning direction every time the reading position of said reading means is moved in the main scanning direction;

detection means for detecting a difference between image data outputted from said reading means during a preceding movement of the reading position in the main scanning direction and image data outputted from said reading means during a current movement of the reading position in the main scanning direction; and

correction means for correcting the image data outputted from said reading means based on the difference detected by said detection means.

4,954,914

APPARATUS FOR READING AN IMAGE

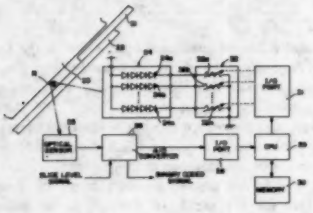
Toshiaki Karita, Sakurai, and Takashi Watanabe, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1988, Ser. No. 279,420

Claims priority, application Japan, Dec. 2, 1987, 62-306645

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—475 **7 Claims**



1. An apparatus for reading an image from a document, comprising:

a light emitting means which has a plurality of light emitting device;

a back plate disposed in the vicinity of a region in which the document is to be irradiated;

an optical sensor means which produces output signals, the level of each of which corresponds to the level of light beams which have been reflected from said document or back plate and are incident on said optical sensor means;

an adjust means which changes the output level of each of or each group of said light emitting devices; and

a control means which controls said adjust means in such a manner that the output levels of said light emitting devices are substantially equal to each other, in response to said output signals of said optical sensor means which are obtained from light beams reflected from said back plate when no document is in said region.

4,954,915

AUTOMATIC CASSETTE CHANGER

Atsushi Koda; Shinji Okuda, and Wataru Nonaka, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,804

Claims priority, application Japan, Aug. 18, 1987, 62-125258[U] Aug. 26, 1987, 62-129848[U]

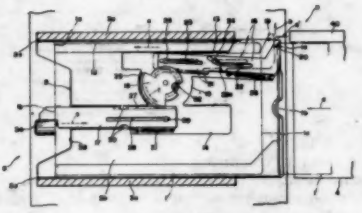
Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—92 **7 Claims**

1. An automatic cassette changer which includes a plurality of cassette storing racks each for storing A cassette therein and a cassette transporting means for transporting a cassette to a recording or reproducing device, said cassette transporting means including a pushing means and each of said cassette storing racks including

a sliding member disposed to be pushed by said pushing means provided on said cassette transporting means to move in a direction away from said cassette transporting means and

a cassette pressing member connected with said sliding member and disposed to be moved in response to move-



ment of said sliding member in a direction toward said cassette transporting means by a distance proportional to the amount of movement of said sliding member,

said cassette pressing member having an end portion thereof remote from said cassette transporting means, and said end portion being formed with an abutting portion for abutting a face of the cassette stored in the cassette storing rack for ejecting said cassette from said rack in a direction toward said cassette transporting means.

4,954,916

CASSETTE LOADING APPARATUS WITH IMPROVED ACCESS

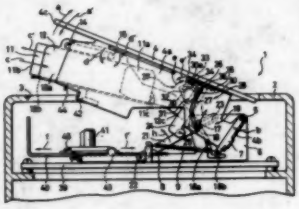
Noriaki Tobimatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 7, 1988, Ser. No. 280,976

Claims priority, application Japan, Dec. 15, 1987, 62-190221

Int. Cl.[5] G11B *15/675*

U.S. Cl. 360—96.5 **3 Claims**



1. A cassette recording-medium recording and/or reproducing apparatus comprising:

a cabinet;

cover means moveable between a closed position and an open position for covering and uncovering an opening provided in said cabinet;

cassette holding means slidably engaged inside said cover means so as to be located in a cassette receiving position that is outside said opening when said cover means is moved to its open position to uncover said opening and to be located in a cassette loading position that is within said cabinet when said cover means is moved to its closed position to cover said opening;

a chassis mounted within said cabinet;

driving means fixed to said chassis for driving a recording-medium accommodated in a cassette that has been

brought to said cassette loading position by said cassette holding means after being inserted into said cassette holding means in said cassette receiving position; and

guide means connected to said cassette holding means for causing said cassette holding means to slide with respect to said cover means in a direction substantially the same as a direction in which said cassette is withdrawn from said cassette holding means, when said cassette holding means is moved from said cassette loading position to said cassette receiving position,

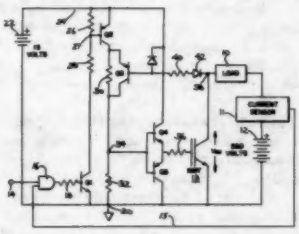
said guide means comprising support plate means fixed with respect to said cabinet, and cam means and cam follower means each connected to one of said cassette holding means and support plate means, said cam follower means engaging said cam means to cause relative sliding movement between said cassette holding means and said cover when said cover is moved between said closed position and said open position.

4,954,917

POWER TRANSISTOR DRIVE CIRCUIT WITH IMPROVED SHORT CIRCUIT PROTECTION

William F. Wirth, Sullivan, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Apr. 12, 1989, Ser. No. 336,931
Int. Cl.[5] H02H 3/087
U.S. Cl. 361—98 **9 Claims**



1. A circuit for controlling the application of electricity to a load comprising:

an insulated gate bipolar transistor having a gate, an emitter and a collector with the emitter-collector conduction path coupling the load to a source of electricity;

means for sensing the voltage across the collector and emitter of said transistor;

means for driving the gate of said transistor at a first voltage level in response to said means for sensing indicating that the voltage across the collector and emitter is below a given threshold level, or at a second voltage level in response to said means for sensing indicating that the voltage across the collector and emitter is above the given threshold, the first voltage level producing a greater emitter-collector conductivity than the conductivity produced by the second voltage level; wherein said means for driving comprises a voltage divider formed by a pair of resistors connected in series by an intermediate node with the voltage at the intermediate node determining a voltage level at the gate of the insulated gate bipolar transistor.

4,954,918

CASSETTE TRANSFER APPARATUS

Masao Shiosaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1989, Ser. No. 323,692
Claims priority, application Japan, Mar. 17, 1988, 63-64055
Int. Cl.[5] G11B 5/012, 15/68
U.S. Cl. 360—98.06 **11 Claims**

1. A cassette transfer apparatus for transferring to a desired location a cassette having a plurality of engagement portions, the transfer apparatus comprising:

means for holding the cassette, said holding means including an entry and exit port for admitting the cassette into holding means and ejecting the cassette from the holding means; and

means for delivering the cassette to the holding means, said delivery means including:

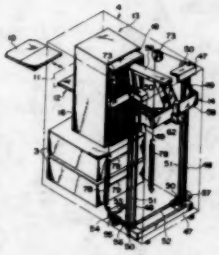
a plurality of first guide rollers attached to the holding means adjacent the entry and exit port;

a plurality of second guide rollers attached to the holding means and spaced from said first guide rollers;

a plurality of belts, each said belt extending between a respective first and second guide roller and including a linear portion extending along the holding means, the linear portions of each said belt facing each other at a distance substantially equal to the width of the cassette;

a plurality of engaging members disposed in engagement with the respective portions of cassette and attached to a respective belt for movement therewith, each of the engaging members including a guide pin;

means for driving each of the belts in a forward direction for producing a forward movement of the belt to deliver the cassette to the holding means and for driving each of the belts in a reverse direction for producing a reverse movement of the belt to deliver the cassette from the holding means, said first and second guide rollers and said belts being arranged so that during the



forward movement of the belts, the engaging members are rotated to engage the engagement portions of the cassettes while passing around the respective first guide rollers and move while engaging the engagement portions of the cassette as the engaging member passes along the linear portions of each said belt, and during the reverse movement of the belts, the engaging members move while engaging the engagement portions of the cassette as the engaging member passes along the linear portions of each said belt and rotate and disengage from the engagement portions of the cassette while passing around the first guide rollers; and

means for guiding each said guide pin when the engaging members move along the linear portions of the belts, so as to prevent rotation of the engaging members.

2. A cassette transfer apparatus for transferring to a desired location a cassette having an engagement portion, said transfer apparatus comprising:

means for holding the cassette, said holding means having a cassette entry and exit port for admitting the cassette into the holding means and for ejecting the cassette from the holding means; and

means for delivering the cassette to the holding means, the delivery means including:

a first guide roller attached to the holding means adjacent the entry and exit port;

a second guide roller attached to the holding means and spaced from the first guide roller;

a belt extending between the first and second guide rollers including a linear portion extending along the holding means;

an engaging member disposed in engagement with the engagement portion of the cassette and attached to the belt for movement therewith, the engaging member including a guide pin, the first and second guide rollers and the belt being arranged so that said engaging member is rotated to engage the engagement portion of the cassette as the engaging member passes around the first guide roller and moves while engaging the engagement portion of the cassette as the engaging member passes along the linear portion of said belt;

means for driving the belt to cause the engaging member to engage the cassette and to deliver the cassette into the holding means; and

means for guiding the guide pin while the engaging member, together with the cassette, moves along the linear portion of the belt so as to prevent rotation of the engaging member.

4,954,919

ROTARY SEEK MAGNETIC HEAD ASSEMBLY HAVING A LOOPED LOAD BEAM END TO ACHIEVE HIGH SPEED ACCESS

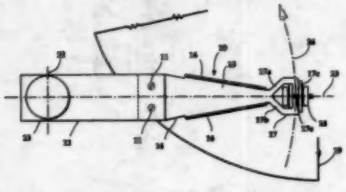
Tadaharu Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 382,882

Claims priority, application Japan, Jul. 25, 1988, 63-186231; Jul. 26, 1988, 63-187109

Int. Cl.[5] G11B *5/48*

U.S. Cl. 360—104 **6 Claims**



1. A magnetic head assembly comprising:

a rigid arm section mounted at one end thereof on a rotary shaft;

a load beam element joined to the other end of said rigid arm section, said element having a portion substantially resilient adjacent to said rigid arm section and a looped load bearing section, said element being substantially rigid between said resilient portion and said looped load bearing section to present a loading force on said looped load bearing section, said looped load bearing section having arms extending from said element to a cross leg which runs substantially parallel to the direction of rotation of said rotary shaft;

a gimbal spring of rectangular configuration, said gimbal spring having a pair of outer flexible fingers joined at their first ends to one of said arms of said looped load bearing section and joined at their second ends by a cross leg, and a central finger extending from the last-mentioned cross leg, said outer fingers and said central finger running substantially parallel to the direction of rotation of said rotary shaft;

means for providing a point contact between said central finger and the cross leg of said looped load bearing section; and

an air bearing slider fastened to said central finger of said gimbal spring.

4,954,920

THIN FILM MAGNETIC HEAD

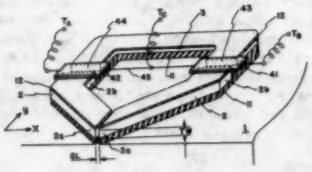
Kazuhiko Yamada, and Takao Maruyama, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 30, 1987, Ser. No. 126,577

Claims priority, application Japan, Nov. 28, 1986, 61-284784; Nov. 28, 1986, 61-284785; Nov. 28, 1986, 61-284787

Int. Cl.[5] G11B *5/127, 5/33*

U.S. Cl. 360—113 **1 Claim**



1. A thin film magnetic head for reading recorded information from a magnetic recording medium which is moving in a first direction relative to said thin film magnetic head, said thin film magnetic head comprising:

a pair of yokes made of a magnetically permeable film having a predetermined thickness, said pair of yokes being formed on a substrate and covered by a first insulative layer, said thickness of said yokes defining a track width of said thin film magnetic head, a space between first ends of said pair of yokes defining a magnetic gap of said thin film magnetic head, second ends of said pair of yokes being spaced apart from each other, a magnetic anisotropy of said pair of yokes being directed in substantially said first direction;

a pair of magneto-resistive elements magnetically connected to said second ends of said pair of yokes, respectively, said pair of magneto-resistive elements being formed on said first insulative layer and covered by a second layer,

a return path made of a magnetically permeable film, a coil surrounding said return path for supplying recording current, said return path magnetically connecting said pair of magneto-resistive elements, a magnetic anisotropy of said return path being directed in a second direction which is substantially perpendicular to said first direction, said coil including lower and upper coil patterns, said lower coil pattern being formed on said second insulative layer and covered by a third insulative layer, said return path being formed on said third insulative layer and covered by a fourth insulative layer, said upper coil pattern being formed on said fourth insulative layer, and both ends of said upper coil pattern being connected to both ends of said lower coil pattern at positions where said third and fourth insulative layers are removed.

4,954,921

MAGNETIC TRANSDUCER HEAD STRUCTURE WITH REDUCED LEAKAGE BETWEEN CORE CIRCUITS

Michael L. Bolt, Ann Arbor, Mich., assignor to Irwin Magnetic Systems, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 915,734, Oct. 6, 1986, Pat. No. 4,819,107, which is a continuation-in-part of Ser. No. 645,436, Aug. 29, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 241,090

Int. Cl.[5] G11B *5/265*

U.S. Cl. 360—121 **9 Claims**

1. A magnetic core structure for a transducer head particularly adapted for use in digital data storage devices, comprising:

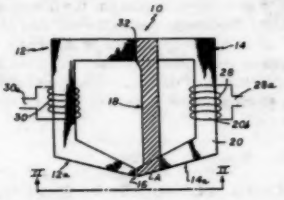
a magnetic circuit formed by magnetic core elements, said circuit having at least one gap defined by two opposing sides where magnetic flux in such circuit may access magnetically-recordable data storage media;

means forming a first magnetic pole structure for said circuit and defining one side of said gap, and means forming a second magnetic pole structure for said circuit and defining the other side of said gap, generally opposite said first pole structure;

at least said first magnetic pole structure having a laminar structure comprising at least one strata and at least one flanking strata, each comprising magnetic and having a predetermined magnetic reluctance;

said flanking strata being disposed in adjacent overlapping relationship with portions of said medial strata along said gap to thereby define an included area of overlap whose magnitude is determined by the length and width of that portion of the flanking strata overlying said medial strata at the gap, said medial strata having a thickness at said gap measured in a direction along said gap which is less than the thickness of said second pole structure disposed across said gap, to thereby access a narrower recorded band on said media than that accessed by said second pole structure;

isolation means comprising at least one layer of non-magnetic material disposed between said medial strata and said



flanking strata at said included area of overlap, for magnetically separating at least said portions of said medial strata from the overlapping portions of the flanking strata;

said flanking strata serving to magnetically shunt portions of said magnetic circuit formed by said medial strata by extending alongside and into magnetic communication with said medial strata at a point along said magnetic circuit which is spaced from said first pole structure in the direction of said second pole structure, to thereby provide a parallel magnetic return;

said isolation means layer being thin in relation to said flanking strata and having a thickness less than one-half that of the adjacent flanking strata;

and said included area of overlap between said medial strata and said flanking strata at said first pole structure having a magnitude which makes the effective magnetic reluctance of said isolation means layer disposed therebetween sufficiently large with respect to the magnetic reluctance of said flanking strata that the transfer of magnetic flux from the flanking strata to the medial strata across the non-magnetic isolation means at said included area is limited to less than about ten percent of the total magnetic flux present in said magnetic circuit.

4,954,922

PROTECTIVE SYSTEM FOR PORTABLE ELECTRICALLY POWERED APPARATUS

Harry Gaus, Schwanheimer Str. 93, Bensheim, Fed. Rep. of Germany D-6140 ; Hagen Gross, Am Zollstock 29, Bad Homburg, Fed. Rep. of Germany D-6380 , and Günter Schliebs, Claudiusweg 17A, Darmstadt, Fed. Rep. of Germany D-6100

Filed Sep. 30, 1988, Ser. No. 252,515

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813796

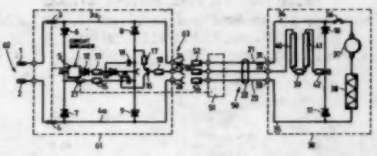
Int. Cl.[5] H02H *5/04*

U.S. Cl. 361—42 **21 Claims**

1. An electrically powered apparatus having a flexible shielded two conductor power cord and an electronic protective system housed in a main connection plug or in an adapter connectable to a main power source, said electronic protective system being comprised of:

(a) A probe contained in the apparatus, which probe exhibits a change of its electrical impedance in the presence of a liquid;

(b) An automatically controlled electronic switching circuit powered by the main power source, said switching circuit having connected to its input a signal line leading from the probe via the shielding of the power cord, wherewith said switching circuit is triggered if the impedance of the probe changes by a prescribed amount; and



(c) A protective switch inserted in the leads of the plug or adapter, which protective switch is triggered by electrical current occurring when the switching circuit is triggered;

characterized by a control current loop being provided which is formed from the switching circuit to the protected apparatus and the probe of the apparatus, and returning via the shielding of the power cord back to the electronic circuit, which control current loop carries a direct current regardless of the operating state of the protected apparatus, and wherewith, as long as the current through said loop is between a lower and an upper limit value, the electronic circuit is not triggered.

4,954,923

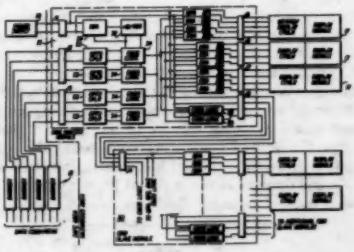
INTRINSIC SAFETY MODULE INTERFACE

John C. Hoeflich, Austin, and David W. Curry, Cedar Park, both of Tex., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 19, 1988, Ser. No. 234,037

Int. Cl.[5] H02H *3/20*

U.S. Cl. 361—111 **12 Claims**



1. An interface system interconnecting a common power source and a plurality of data communications paths located in a safe environment to a plurality of load devices located in a flammable atmosphere which share said common power source, said interface system comprising first attenuating means in said flammable atmosphere for attenuating the electrical power supplied by said power source to said plurality of load devices to a first predetermined power level, second attenuating means in said flammable atmosphere for attenuating the electrical power delivered by said data communications paths to said plurality of load devices to a second predetermined power level, said first and second attenuating means

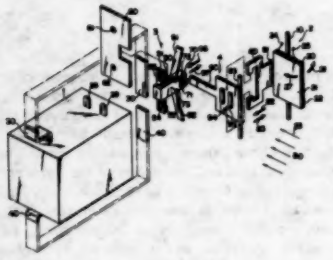
increasing the total electrical power transferred from said common power supply to said load devices such that the sum of storage capacities of said load devices is greater than an allowable storage capacity for a single load device consisting of any of said load devices, and coupling means for segregating said power source from said data communications paths to and from said safe environment.

4,954,924

SWITCH FOR HIGH MAGNETIC FIELD

Motoji Haraguchira, Tochigi, and Yoshimi Maekawa, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 16, 1988, Ser. No. 271,833
Claims priority, application Japan, Nov. 18, 1987, 62-289402
Int. Cl.[5] H01H *9/00*
U.S. Cl. 361—187 **13 Claims**



1. A switch for use in a high magnetic field induced in a high magnetic field generator, including at least one circuit to be switched, comprising:

driving means, including at least a coil and a non-magnetic element, which are reversibly movable under a mutual electromagnetic atmosphere obtained by flowing electric current in the coil and the high magnetic field;

opening/closing means having a movable contact and a fixed contact, for closing the circuit by connecting the movable contact to the fixed contact, and opening the circuit by separating the movable contact from the fixed contact; and

transmitting means located between said driving means and said opening/closing means for transmitting a driving force of said driving means to said opening/closing means to latch the movable and fixed contacts;

wherein said driving means comprises a rotation shaft mounted within a housing made of non-magnetic material and a coil mounted relative to the rotation shaft which, upon the flow of electric current through the coil, excites said coil under a mutual electromagnetic atmosphere of electric current in the coil and high magnetic force created by said magnetic field generator.

4,954,925

CAPACITIVE SENSOR WITH MINIMIZED DIELECTRIC DRIFT

Robert H. Bullis, Avon; James L. Swindal, East Hampton; Walter J. Wiegand, Jr., Glastonbury; Charles B. Brahm, Ellington, and Harold D. Meyer, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

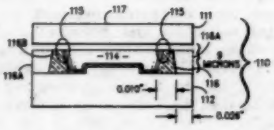
Filed Dec. 30, 1988, Ser. No. 292,282
Int. Cl.[5] G01L *9/12*
U.S. Cl. 361—283 **16 Claims**

1. A capacitive sensor of the silicon-dielectric-silicon type used to sense physical changes, such as, for example, pressure changes, comprising:

a conductive silicon substrate;

a conductive, elastic, flexible silicon diaphragm having an exterior side, said diaphragm being capable of flexing movement due to physical changes being sensed; and

a non-conductive, dielectric wall spacer layer between said silicon substrate and said silicon diaphragm, said layer providing peripheral wall(s) extending substantially above said silicon substrate and joining said silicon substrate and said silicon diaphragm together; an evacuated, closed, hermetically sealed chamber being formed between said



silicon substrate and said silicon diaphragm and being closed off at the sides above said substrate by said wall(s) formed by said dielectric layer between said silicon substrate and said silicon diaphragm; the flexing movement of said silicon diaphragm due to the physical changes being sensed causing the capacitance of the sensor to vary; the capacitance contribution of said dielectric layer to the total capacitance of the sensor being no more than about twenty-to-twenty-five percent of the total capacitance of the sensor.

4,954,926

THICK FILM CONDUCTOR COMPOSITION

John G. Pepin, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 28, 1989, Ser. No. 385,309
Int. Cl.[5] H01G *1/015, 4/10*
U.S. Cl. 361—304 **10 Claims**

1. A thick film conductor composition suitable for use for electrodes in multilayer capacitors comprising

(a) finely divided particles of electrically conductive metal selected from Pd, Ag, Pt, Au, Cu, Ni, oxide precursors and alloys of the aforesaid conductive metals, and mixtures thereof, dispersed in

(b) an organic medium comprising

(1) an organometallic compound, the metal or metal oxide moiety of which is insoluble in the electrically conductive metal and/or the oxide(s) of the metal moiety are non-reducing in the presence of the electrically conductive metal, the organometallic compound being dissolved in;

(2) a solution of polymeric binder and volatilizable solvent, the amount of organometallic compound being such that the metal moiety thereof constitutes at least 0.05% by weight of the total composition.

4,954,927

DOUBLE CAPACITOR AND MANUFACTURING METHOD THEREOF

Han-su Park, Yulchon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea

Filed May 31, 1989, Ser. No. 359,771
Claims priority, application Rep. of Korea, Sep. 16, 1988, 88-12002[U]
Int. Cl.[5] H01G *4/38, 7/00*; H01L *27/02*
U.S. Cl. 361—328 **17 Claims**

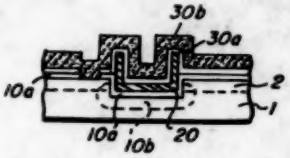
1. A double capacitor for a semiconductor integrated circuit capable of being connected to another circuit element comprising:

a first capacitor comprising:

a first conductor formed in a substrate below and alongside a recess formed on one side of said substrate,

a first non-conductor disposed over said first conductor, and

a common ground conductor having a "U" shape disposed over said first non-conductor and within said recess and having free ends extending beyond said recess; and



a second capacitor comprising:

said common ground conductor,

a second generally M-shaped non-conductor disposed over said common ground conductor, and

a second conductor disposed over said second non-conductor.

4,954,928

MEMORY CARTRIDGE FOR ELECTRONIC EQUIPMENT, AND ELECTRONIC EQUIPMENT PROVIDED WITH SUCH CARTRIDGES

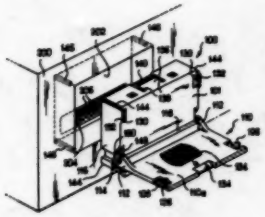
Claude Jullien, Sartoux, France, assignor to La Telemecanique Electrique, France

Filed Sep. 16, 1988, Ser. No. 245,257

Claims priority, application France, Sep. 18, 1987, 87 12974

Int. Cl.[5] H05K 7/14

U.S. Cl. 361—391 **17 Claims**



1. A removable memory cartridge for electronic equipment such as a programmable automaton, said cartridge being of the type comprising: a box, a memory unit mounted in said box, and an elongate connector fixed to said box and enabling said memory unit to be interconnected with electronic equipment, said connector mechanically fixing the cartridge in said electronic equipment, said box having grasping means to enable said cartridge to be extracted by separating the connector, the grasping means having a flat member hinged about an axis lying approximately in the midplane of the connector, said flat member occupying a first position against said box without substantially increasing the size thereof, and occupying a second position away from the box in which said flat member is graspable in order to exert an extraction force on the box acting substantially level with the connector.

4,954,929

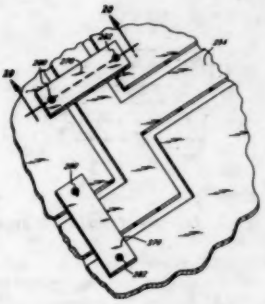
MULTI-LAYER CIRCUIT BOARD THAT SUPPRESSES RADIO FREQUENCY INTERFERENCE FROM HIGH FREQUENCY SIGNALS

Jozef B. Baran, Moreno Valley, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Aug. 22, 1989, Ser. No. 396,956

Int. Cl.[5] H05K 9/00

U.S. Cl. 361—414 **9 Claims**



1. A multi-layer printed circuit board connectable to first and second voltage reference sources, said printed circuit board suppressing radio frequency interference generated by high frequency signals present in electronic circuitry on said printed circuit board, said printed circuit board comprising:

a first interconnection layer comprising electrically conductive material formed into a plurality of electrically conductive paths to interconnect said electronic circuitry on said circuit board;

a first voltage reference layer connectable to the first voltage reference source, said first voltage reference layer positioned in parallel with said layer of electrically conductive material;

a second voltage reference layer connectable to the second voltage reference source, said second voltage reference layer positioned in parallel with said first voltage reference layer;

means for selectively connecting said first voltage reference layer to said electronic circuitry;

means for selectively connecting said second voltage reference layer to said electronic circuitry; and

at least one signal line formed on said first voltage reference layer, said signal line electrically isolated from the first voltage reference source, said signal line surrounded on both sides by portions of said first voltage reference layer connected to the first voltage reference source, said signal line shielded by said first voltage reference layer and said second voltage reference layer to suppress radio frequency interference between a signal on said signal line and signals on said conductive paths on said first interconnection layer.

4,954,930

ILLUMINATION LIGHT GUIDE

Mamoru Maegawa, and Fumio Sakamoto, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 412,071

Claims priority, application Japan, Sep. 27, 1988, 63-125146[U]

Int. Cl.[5] F21V 8/00

U.S. Cl. 362—26 **3 Claims**

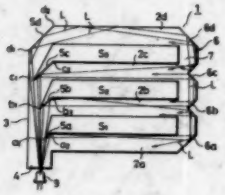
1. An illumination light guide comprising:

a plurality of elongated illuminating portions;

a light guiding path portion connecting one end of each of said illuminating portions;

a light receiving portion formed in said light guiding path portion;

a plurality of light distirbuting/reflecting portions formed in said light guiding path portion so as to correspond to said illuminating portions and having different lengths such that the longer a distance from said light receiving portion to one of said light distributing/ reflecting portions, the



longer a length of the one of said light distributing/reflecting portions;

a plurality of light reflecting portions formed at the other ends of said illuminating portions, respectively ; and

a plurality of slant surfaces for reflecting light upwardly, a single one of said slant surfaces formed at the bottom of each of said illuminating portions.

4,954,931

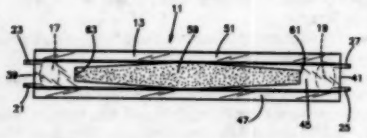
LINEAR DIFFUSE LIGHT SOURCE

William L. Hassler, Jr., El Toro, Calif., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Jul. 8, 1988, Ser. No. 216,750

Int. Cl.[5] F21V *8/00*

U.S. Cl. 362—32 **3 Claims**



1. A light source for producing a relatively uniform dispersed light emission along a length portion thereof, comprising:

a prism having two ends, an emission face and a plurality of optically reflective planar faces, formed of optionally transparent material having a relatively high index of refraction and shaped to capture light emitted longitudinally therein said emission face and said reflective planar faces forming a hexagonal cross-section and said reflective faces forming right angle prism sides adjacent said emission face;

light emitting diodes disposed at the ends of said prisms to emit light longitudinally in said prism so as to be captured therein; and

said prism having an optically transparent and light dispersing frosted window formed in said emission face along a length of the emission face thereof, said window linearly narrowing toward the ends of said prism so as to emit through said window light captured in said prism as it is emitted from said light emitting means in a dispersed, longitudinally uniform way.

4,954,932

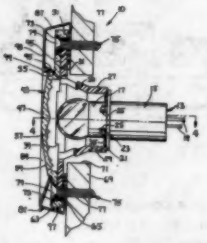
TRANSOM LIGHT

Steve Isenga, Zeeland, Mich., assignor to ITC Incorporated, Zeeland, Mich.

Filed Nov. 22, 1989, Ser. No. 441,035

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **20 Claims**



1. A flush mount lamp assembly for mounting on the hull of a watercraft, comprising:

means for defining a support for a light source, a lens carried on said support means, fastening members extending through said lens and adapted to affix into the hull, bezel means for preventing visual observation of and physical access to said fastening members, and means coacting between said lens and said bezel means for releasably fixing said bezel means on said lens.

4,954,933

DEVICE FOR ADJUSTING THE AIMING DIRECTION OF A MOTOR VEHICLE HEADLIGHT

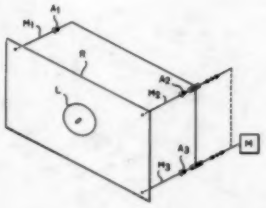
Charles Wassen, Bobigny, France, assignor to Valeo Vision, Bobigny, France

Filed Sep. 18, 1989, Ser. No. 409,020

Claims priority, application France, Sep. 22, 1988, 88 12370

Int. Cl.[5] B60Q *1/06*

U.S. Cl. 362—66 **9 Claims**



1. A device for adjusting the aiming direction of a motor vehicle headlight reflector, said device comprising three essentially localized bearing points to support said reflector against a relatively fixed structure, the three bearing points being placed at the three apexes of a triangle having one horizontal side, one of said points being fixed and the other two points being adjustable through shifting in a direction that is essentially perpendicular to the plane of said triangle, to cause heightwise and lateral variation in the aiming direction of the reflector, and further comprising driving means capable of moving at least one of the two adjustable points, wherein:

the two adjustable bearing points are located on one and the same lateral side of the headlight, opposite the fixed support;

the driving means include a single driving member, and means are provided for selectively connecting the driving

member to a first adjustable bearing point, which is horizontally aligned with the fixed bearing point, or fixing in position said adjustable bearing point, while said driving member is permanently connected to the second adjustable bearing point so as to determine the two modes of adjustment.

4,954,934

PURSE LIGHT

Stephen E. Kidder, P.O. Box 479, Roswell, N. Mex. 88201, and George Spector, 233 Broadway Rm. 3815, New York, N.Y. 10007

Filed Feb. 16, 1989, Ser. No. 311,056
Int. Cl.[5] A45C *15/06*
U.S. Cl. 362—156 **3 Claims**

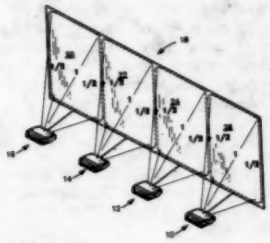
1. A purse light which comprises:
(a) an elongated dome lens having a pair of parallel grooves running along interior of open rear end thereof;
(b) a slideable base plate to fit as a tongue into said grooves;
(c) a battery carried on one end of said base plate;
(d) a light bulb carried in middle of said base plate and electrically connected to said battery;
(e) a toggle switch carried on other end of said base plate and electrically connected between said battery and said light bulb for turning said light bulb on and off; and
(f) means on rear of said dome lens for removably securing said dome lens to interior of a purse so that when said toggle switch is in an on position said light bulb will illuminate the interior of the purse through said dome lens.

4,954,935

LIGHTING SYSTEM FOR ILLUMINATING BILLBOARDS AND THE LIKE

Douglas S. Hammond, and Herbert A. Odle, both of Newark, Ohio, assignors to Holophane Company, Inc., Newark, Ohio

Filed Feb. 8, 1989, Ser. No. 308,166
Int. Cl.[5] F21V *5/00*
U.S. Cl. 362—245 **8 Claims**



1. A lighting system for illuminating a sign having one or more panels, each of said panels having its vertical height greater than its horizontal width, said lighting system comprising, a luminaire for each panel, each of said luminaires including a lamp positioned below and away from the central portion of its respective panel in such a manner as to provide a maximum amount of luminance directly from the lamp to said panel, reflector means for reflecting luminance directly to the panel, and refractor means for redirecting direct light to illuminate the panel whereby the central portion of each panel receives twice the illumination than the sides of the panel so that overlapping light from adjacent sign panels will cumulatively provide the adjacent sides of sign panels with the same amount of light as the center of each sign panel.

4,954,936

ASEISMATIC STRUCTURE OF AN INDICATING LAMP

Masaaki Kawabata, Toyonaka, and Tokio Kawashima, Osaka, both of Japan, assignors to Sasaki Electric Corporation, Osaka, Japan

Filed Dec. 13, 1989, Ser. No. 450,259
Claims priority, application Japan, May 17, 1989, 64-56828
Int. Cl.[5] F21V *21/00*
U.S. Cl. 362—249 **6 Claims**

1. An indicating lamp, comprising:
an internal chassis having means for fixing an electric lamp and an electric control board thereto, aid internal chassis including a fixing plate, said fixing plate having through-holes formed therein;
an indicating lamp cover means covering said internal chassis and having through-holes formed therein;
a fixture for attaching the indicating lamp to an external structure;
a boss fitted to said fixture and having a flange portion, said flange portion having a first side, a second side opposite said first side, and through-holes formed therein;
an insulating member disposed between said fixing plate and said cover means, said insulating member abutting at least one of said first and second sides of said flange portion and having through-holes formed therein;
clamping means, including clamping members extending through the through-holes of said cover means, said insulating member, said flange portion and said fixing plate, for clamping said insulating member, said flange portion, and said indicating lamp cover means to said fixing plate; and
means, including cylindrical spacers fitted through the through-holes of said insulating member and said flange and each having a predetermined length, for limiting to a predetermined spacing a distance between said fixing plate and said indicating lamp cover means, said clamping members extending through said spacers, each of said spacers having an internal diameter permitting said clamping members to be freely withdrawn from and inserted into said spacers.

4,954,937

LIGHTING LAMP

Yasuo Kobayashi; Naoki Hagiwara; Taisuke Hirota; Churyo Kodama; Yasuo Hirasawa; Katsumi Miyazaki; Fumio Kawamura; Takao Higashi, all of Tokyo; Masami Yanagisawa, and Akinori Sei, both of Shizuoka, all of Japan, assignors to Tomoegawa Paper Co., Ltd. and Hitachi Ltd., both of Tokyo, Japan

Filed Sep. 8, 1989, Ser. No. 404,657

Claims priority, application Japan, Sep. 8, 1988, 63-223615; Sep. 8, 1988, 63-223616; Jul. 26, 1989, 1-191390

Int. Cl.[5] F21M *3/14*

U.S. Cl. 362—255 14 Claims

1. A lighting lamp comprising a lamp having laminated on the surface of a bulb thereof a display sheet, said display sheet comprising a support having thereon an active layer containing a pigment which is faded by the action of an active light and an active light-adjusting layer.

4,954,938

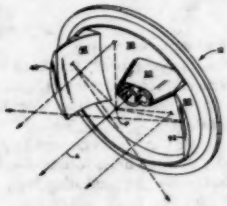
LIGHT WITH WIDE ANGLE RADIATION PATTERN

H. Wayne Lyons, Killingsworth, Conn., assignor to Whelen Technologies, Inc., Chester, Conn.

Filed Feb. 21, 1989, Ser. No. 312,479

Int. Cl.[5] F21V *7/00, 33/00*

U.S. Cl. 362—298 22 Claims



1. A light assembly comprising: body means for forming an integral rigid base structure, said body means comprising:

first reflector means for defining a dish-like parabolic reflector surface which is symmetrical about a central axis, said first reflector means defined parabolic surface having a focal point and a vertex which lie on said central axis;

mounting means projecting from said first reflector means parabolic surface for mounting a light emitter, said central axis extending through said mounting means; and

first and second wing means extending from said first reflector means for forming a pair of generally axially projecting wing-like extensions, said first and second wing means being located at equidistantly spaced diametral positions relative to said central axis, said wing means each defining a parabolic reflector surface, the paraboloids of revolution which include said wing means reflector surfaces each having a vertex and a focal point which define an axis, said wing means reflector surface paraboloidal axes being angularly oriented relative to a plane in which said central axis lies, said plane being substantially equidistantly spaced from said first and second wing means, the focal points of said wing means paraboloids of revolution being substantially coincident with said first reflector means focal point; and

light emitter means supported by said mounting means for emitting light upon energization thereof, said light emitter means being at least in part positioned at said focal point.

4,954,939

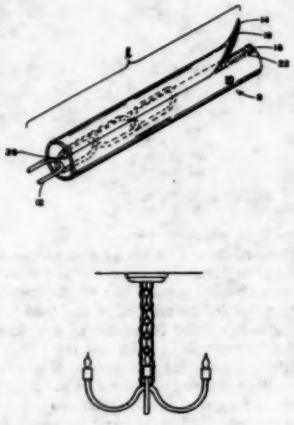
ADJUSTABLE AND REMOVABLE CHANDELIER CHAIN COVER

Brenda Q. Hutchins, P.O. Box 5008, Winston-Salem, N.C. 27113-5008

Filed Feb. 13, 1989, Ser. No. 309,186

Int. Cl.[5] F21S *3/06*

U.S. Cl. 362—406 6 Claims



1. In a chandelier fixture affixed to a supporting ceiling having a chandelier, a chain with first and second ends, the first end secured to said chandelier and the second end secured to the ceiling, a light carried by said chandelier, and electrical conductors cooperatively extending along said chain, the improvement comprising: an adjustable and removeable chandelier chain cover encircling said chandelier chain and said cooperating electrical conductors and extending from the ceiling to said chandelier, a longitudinal portion of fabric material encircling the chandelier chain having a predetermined length sufficient to cover entirely the chain and conductors cooperating therewith and first and second engaging edges, fastening means fixedly secured to one of said portion-engaging edges, and a strip of fastening material secured to the other of said portion-engaging edges whereby the strips of fastening material engage each other when the edges are joined and the portion of fabric material encircles the chandelier chain and conductors to form a tubular cover having a circular cross-section and a connecting and flexible joint.

4,954,940

PLUG IN POWER CONVERTER STRUCTURE

Bill B. Chandler, 965 Broadview Pl., Colorado Springs, Colo. 80904, and Ramona Z. Olson, 920 N. Cedar St., Colorado Springs, Colo. 80903

Filed Oct. 14, 1988, Ser. No. 257,541

Int. Cl.[5] H02M *1/00*

U.S. Cl. 363—146 3 Claims

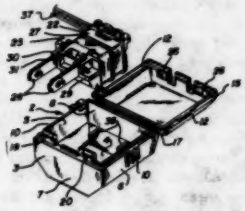
1. An electrical plug comprising:

a split housing forming top, bottom and wall members,

latch means disposed internally of the housing for fastening the top and bottom members of the housing together,

an electrical component disposed, at least partially, within

said housing and having rigid substructure means making contact with the latch means and an opposing wall member of the housing, forming a compression brace to prevent unlocking movement of the latch means.



4,954,941

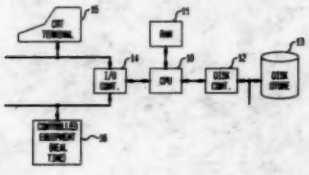
METHOD AND APPARATUS FOR PROGRAM UPDATING

Brian E. Redman, Chatham, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 31, 1988, Ser. No. 238,485

Int. Cl.[5] G06F 9/44

U.S. Cl. 364—200 **12 Claims**



1. A system for updating a programmed process in a computer comprising

means for replacing the stored object code of a programmed process in the internal memory of a computer without terminating the execution of said process, and

means for enabling said means for replacing said stored object code from a source outside of said process with updated object code.

4,954,942

SOFTWARE DEBUGGING SYSTEM FOR WRITING A LOGICAL ADDRESS CONVERSION DATA INTO A TRACE MEMORY OF AN EMULATOR

Satoshi Masuda, Sayama; Ikuya Kawasaki, Tokyo, and Shigezumi Matsui, Kodaira, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,757

Claims priority, application Japan, Nov. 20, 1987, 62-293809

Int. Cl.[5] G06F 9/455, 12/10, 11/28

U.S. Cl. 364—200 **1 Claim**

1. A data processing system for debugging software, the system comprising:

a main memory for receiving logical and physical address data;

a data bus;

a data processor in communication with the main memory through the data bus, said data processor including:

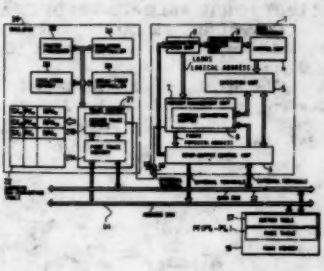
(i) a memory management unit for converting logical address data to physical address data,

(ii) a means for generating an indication signal representing an access of the main memory by the data processor wherein, said indication signal is generated upon detection that selected logical address data is absent from the memory management unit; and

an emulator in communication with an address bus, said emulator including:

(i) a means for storing address conversion information from the data bus,

(ii) a means for converting physical address data to logical address data; and



an electrode means for directly transmitting the indication signal from the memory management unit of the data processor to the emulator, the indication signal enabling the emulator to access the physical address data from the address bus and permitting the storage of newly generated address conversion information in the address conversion information storing means for conversion of physical address data to logical address data by the converting means of the emulator.

4,954,943

DATA PROCESSING SYSTEM

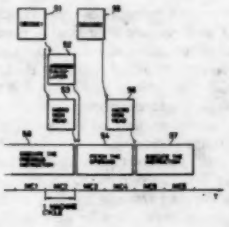
Ikuya Kawasaki, Kodaira; Keiichi Kurakazu, Tachikawa, and Hideo Maejima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 15,016, Feb. 17, 1987. This application Oct. 2, 1989, Ser. No. 415,722

Claims priority, application Japan, Feb. 26, 1986, 61-39192

Int. Cl.[5] G06F 9/34

U.S. Cl. 364—200 **16 Claims**



1. A method of controlling processing in a microprocessor having decode means for decoding at least two words of a plurality of words forming an instruction including a first word having first information for specifying an address of an operand and size information for specifying the size of said operand and a second word having an operation code, execution means for performing an operation designated by said operation code on said operand, and control means for controlling said execution means in accordance with an output of said decode means, comprising the steps of:

(a) decoding said first information, using said decode means;

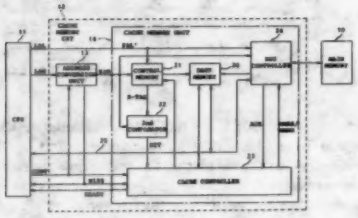
(b) providing said operand on the basis of said size information and the decoded result produced in said step (a);
(c) decoding said second word, using said decode means, after said step (a) to determine an operation to be performed; and
(d) processing said operand using said execution means in accordance with the operation determined in said step (c).

4,954,944

CACHE COTROL CIRCUIT IN CACHE MEMORY UNIT WITH UNIT FOR ENABLING TO REDUCE A READ ACCESS TIME FOR CACHE MEMORY

Sadanobu Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,912
Claims priority, application Japan, Apr. 23, 1987, 62-98564
Int. Cl.[5] G06F *13/00*
U.S. Cl. 364—200 **5 Claims**



1. In a cache control circuit in a cache memory unit for use in cooperation with a main memory, a request source, and an address conversion unit, said request source producing a control signal comprising a read/write request together with a logical address comprising a first logical address portion and a second logical address portion,

said address conversion unit converting said first logical address portion into a first physical address portion corresponding to said first logical address portion to produce said first physical address portion as a converted address signal at an output terminal when said address conversion unit has said first physical address portion corresponding to said first logical address portion,

said address conversion unit producing a mismatch signal when said address conversion unit has no first physical address portion corresponding to said first logical address portion,

said mismatch signal being delivered to said cache control circuit and said request source at a predetermined time duration after reception of said control signal,

said request source deciding that said read/write request is invalid upon reception of said mismatch signal,

said second logical address portion being directly applied to said cache memory unit as a second physical address portion without conversion,

said cache memory unit comprising data memory means for temporarily holding a data block of data in said main memory which is currently used by said request source, control memory means for holding pairs of address tags and data memory addresses of said data block held in said data memory means, said control memory means being responsive to said second physical address portion producing one pair of said pairs of said address tags and said data memory addresses which correspond to said second physical address portion as a read address tag and a read data memory address, and comparing means coupled with said output terminal of said address conversion unit for comparing said read address tag with said converted output signal at said output terminal to deliver a hit signal to said cache control circuit when said read address tag is in conformity with said converted output signal,

said cache control circuit receiving said control signal, said cache control circuit producing a read access signal for carrying out a read operation for said data memory means with use of said read data memory address when said read/write request of said control signal is a read request,

said cache control circuit comprising:

decoding means responsive to said control signal for decoding said control signal to extract said read request to produce a read request signal, said decoding means producing a start signal on reception of said control signal;

timing generator means coupled to said decoding means and responsive to said start signal for sequentially generating timing signals at predetermined intervals; and

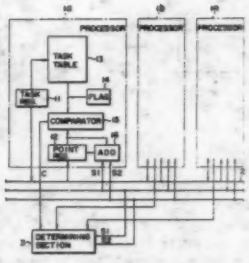
means coupled with said decoding means and said timing generator means for producing said read access signal to said data memory means upon reception of both of said read request signal and a first one of said timing signals which is initially produced from said timing generator means, whereby a read operation for said data memory means starts without relation to said hit signal and said mismatch signal.

4,954,945

PROCESSOR-SELECTION SYSTEM

Atsushi Inoue, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 5, 1987, Ser. No. 22,087
Claims priority, application Japan, Mar. 29, 1986, 61-72110
Int. Cl.[5] G06F *15/16, 9/40*
U.S. Cl. 364—200 **3 Claims**



1. A processor-selection system comprising:

a plurality of processors connected to each other via bus lines, and capable of processing various tasks, said plurality of processors each having a predetermined performance level, generating a task-processing request together with the performance level to the other processors, and responsive to the other task-processing request from the other processors, to output a task-enable signal; and

processor determining means connected to the processors, for receiving the task-enable signal and determining which one of said processors is available for executing a requested task in accordance with the performance level, in response to the task-enable signal from at least one of said processors, and for outputting a level-changing signal for changing a requested task-processing performance level, in response to said processing-enable signal which is selectively output from said processor; and said processing includes means for changing said task-processing performance level, in response to said level-changing signal and wherein said processor-determining means is comprised of means for determining whether or not the number of available processors is 1, 0, or more than 2, by way of a processing-enable signal from the processor, and for outputting a corresponding determining signal; and said level-changing means has a function of lowering the

processing performance level for the requested task, in response to the determining signal representing "0", and of raising the processing performance level for the requested task, in response to the determining signal representing more than 2; and

wherein said processors each comprise means for outputting information representing a type of a task to be processed and the performance level; a task table for storing information representing various types of tasks and performance levels required for task processing; flag-storing means for storing a flag showing whether or not the task is now being processed; and means for determining, from the information of said task table and said flag, whether or not a task requested can be performed by another processor, and for outputting, when said task can be performed by another processor, a corresponding processing-enable signal to said processor-determining means;

4,954,946

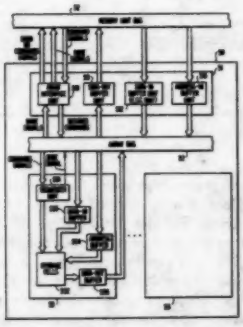
APPARATUS AND METHOD FOR PROVIDING DISTRIBUTION CONTROL IN A MAIN MEMORY UNIT OF A DATA PROCESSING SYSTEM

Paul J. Natusch, Westford; Eugene L. Yu, Groton; David C. Senerchia, Shrewsbury, and John F. Henry, Jr., deceased, late of Townsend, all of Mass. (by Beverly A. Henry, administratrix), assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 823,687, Jan. 26, 1986, abandoned. This application Dec. 21, 1989, Ser. No. 453,088

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—200 **7 Claims**



1. A memory board for use in a memory subsystem of a data processing system, said memory subsystem performing memory operations, such as reading and writing, and including a memory unit bus coupled to said memory board and to at least one additional memory board, and said memory board comprising:

a plurality of storage cell array means for storing data signal groups;

array bus means, coupled to each of said storage cell array means, for transferring signals with each of said storage cell array means;

a plurality of sequencer means, each being coupled to said array bus means and to a corresponding one of said storage cell array means, for controlling the memory operations of the corresponding one of said storage cell array means and for placing onto said array bus means done signals indicating the impending completion of a current one of said memory operations; and

interface means, coupled to said array bus means, for combining said done signals from said plurality of sequencer means into a ready/done signal prior to the time when said storage cell array means have completed their current memory operations and for applying said ready/done signal and a second signal to said memory unit bus, said second signal indicating that said memory board can process no commands.

4,954,947

INSTRUCTION PROCESSOR FOR PROCESSING BRANCH INSTRUCTION AT HIGH SPEED

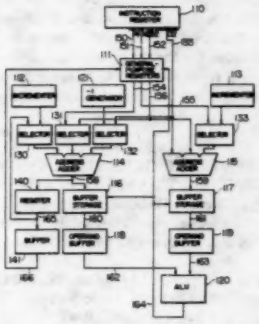
Kazunori Kuriyama, Kokubunji; Kenichi Wada, Sagamihara, and Akira Yamaoka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 859,901, May 5, 1986, abandoned. This application Mar. 21, 1989, Ser. No. 336,741

Claims priority, application Japan, May 7, 1985, 60-95444

Int. Cl.[5] G06F *9/30, 9/32, 9/38, 9/42*

U.S. Cl. 364—200 **9 Claims**



3. An instruction processor for processing instructions, comprising:

(a) an instruction register for sequentially holding instructions to be processed, including operation instructions and branch instructions;

(b) a plurality of registers coupled to said instruction register for storing data;

(c) first address adder means, coupled to said instruction register and said plurality of registers and responsive to an operation instruction in the instruction register, which operation instruction requires execution of an operation on a storage operand, for adding a first group of plural data so as to generate a storage address for the storage operand, wherein the first group of plural data includes at least data provided by one of said plurality of registers designated by the operation instruction and wherein addition of the plural data is performed during a first processing stage for the operation instruction among plural processing stages into which processing of each instruction is divided;

(d) first buffer storage means coupled to said first address adder means for holding storage operands and for providing one of the storage operands required by an operation instruction in response to receipt of a generated storage address from said first address adder means during a second processing stage following said first processing stage for the operation instruction;

(e) operation means connected to receive a storage operand from said first buffer storage means for performing an arithmetic or logical operation on the storage operand during a third processing stage following said second processing stage for the operation instruction;

(f) second address adder means, coupled to said instruction register and said plurality of registers and responsive to a branch instruction in the instruction register, which branch instruction requires execution of an addition operation on data held by a first one of said plurality of registers designated by the branch instruction and fetching of a

target instruction, for adding a second group of plural data so as to generate a storage address for the target instruction, wherein the second group of plural data includes at least data provided by a second one of said plurality of registers designated by the branch instruction and wherein addition of the second group of plural data is performed in said first processing stage for the branch instruction;

(g) second buffer storage means coupled to said second address adder means for holding instructions and for providing the target instruction in response to the storage address generated by said second address adder means, the target instruction being provided in the second processing stage of the processing of the branch instruction; and

(h) wherein said first address adder means includes means for adding a third group of plural data including the data held by said first one of said plurality of registers designated by a branch instruction, during the first processing stage for the branch instruction simultaneously with operation of said second address adder means to generate said storage address for the target instruction and for storing data resulting from said adding in one of said plurality of registers designated by the branch instruction.

4,954,948

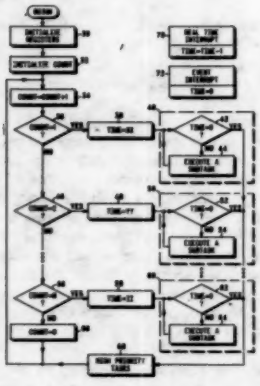
MICROPROCESSOR OPERATING SYSTEM FOR SEQUENTIALLY EXECUTING SUBTASKS

Gerald M. Hirs, Chicago; Dana M. Sheahen, Deerfield; Pamela L. Wilson, Waukegan, and Michael P. Nolan, Elk Grove Village, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 947,118, Dec. 29, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 246,222

Int. Cl.[5] **G06F** *9/46*

U.S. Cl. 364—200 **12 Claims**



1. In a computing system having a program which includes N tasks, where N is two or more, each requiring periodic execution by the computer system, wherein each of the N tasks is comprised of a plurality of associated subtasks, a method for executing the tasks in an orderly fashion, comprising the steps of:

(a) subdividing each of the n tasks into a plurality of associated subtasks and providing a time variable which is periodically updated to represent a measurement of time and providing respective predetermined time periods for the n tasks during which periods the respective tasks are designated to be executed;

(b) setting the time variable to the predetermined time period for a first selected task;

(c) examining the time variable to determine whether or not the predetermined time period associated with the selected task has lapsed;

(d) if the predetermined time period has not lapsed, executing at least one of the subtasks associated with the selected task and then proceeding to step c; and

(e) if the predetermined time period has lapsed, executing a portion of the program other than that which is part of the N tasks, wherein said portion of program has a higher priority than each of the n tasks and then setting the time variable to the predetermined time period for another selected task;

(f) repeating steps c through e once for each of the N-1 remaining tasks; and

(g) thereafter, repeating steps b through f, thereby continually executing subtasks associated with each of the n tasks.

4,954,949

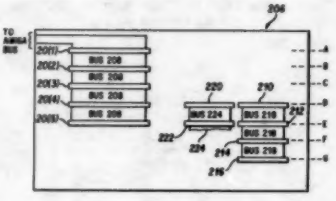
UNIVERSAL CONNECTOR DEVICE FOR BUS NETWORKS IN HOST COMPUTER/CO-PROCESSOR COMPUTER SYSTEM

Henri Rubin, King of Prussia, Pa., assignor to Commodore-Amiga, Inc., West Chester, Pa.

Continuation of Ser. No. 152,954, Feb. 5, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,469

Int. Cl.[5] **G06F** *13/00*

U.S. Cl. 364—200 **6 Claims**



1. A connector device for use in communication of data between the central processing unit (CPU) bus of a host computer system which bus consists of a plurality of continuous electrical conductors and the CPU bus of a first or a second co-processor computer system which bus consists of a plurality of continuous electrical conductors, between the CPU bus of the host computer system and one or more expansion cards used with the host computer system, and between the CPU bus of the first or second co-processor computer system and one or more expansion cards used with the first or second co-processor computer system using a bridge card having a host computer system CPU bus connector and a co-processor computer system CPU bus connector, the connector device comprising:

a plurality of host computer system expansion slots electrically coupled to the continuous electrical conductors of the CPU bus of the host computer system, each of the host computer system expansion slots extending along a first direction and being spaced from each other along a second direction;

a first plurality of co-processor computer system expansion slots electrically coupled to the continuous electrical conductors of the CPU bus of the first co-processor computer system, each of the first plurality of co-processor computer system expansion slots extending along the first direction and being spaced from each other along the second direction, wherein the plurality of host computer system expansion slots and the first plurality of co-processor computer system expansion slots are spaced from each other in the first direction and partially offset from each other in the second direction to form an in-line pair in the first direction from at least one of the plurality of host computer system expansion slots and at least one of the first plurality of co-processor computer system expansion

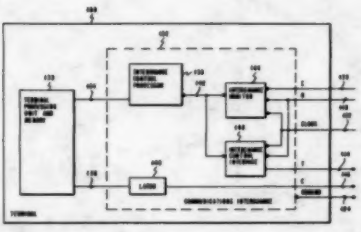
slots to accept simultaneously (1) the host computer system CPU bus connector and the co-processor computer system CPU bus connector of the bridge card in the in-line pair, (2) a host computer system expansion card in a host computer system expansion slot, and (3) a co-processor computer system expansion card in a co-processor computer system expansion slot; and

a second plurality of co-processor computer system expansion slots spaced from the first plurality of co-processor computer system expansion slots and electrically coupled to continuous electrical conductors of a CPU bus of the second co-processor computer system when used with the first plurality of co-processor computer system expansion slots wherein at least one of the plurality of host computer system expansion slots, at least one of the first plurality of co-processor computer system expansion slots, and at least one of the second plurality of co-processor computer system expansion slots form an in-line configuration in the first direction.

4,954,950
TERMINAL COMMUNICATIONS CIRCUIT

William A. Freeman, Austin; James S. Pogorzelski, Georgetown; Darryl W. Solie, and Jacqueline H. Wilson, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1986, Ser. No. 908,532
Int. Cl.[5] G06F *13/14, 13/42;* H04J *3/12*
U.S. Cl. 364—200 15 Claims



8. In a communications network including a network bus interconnecting a plurality of terminals, each terminal including terminal communications circuitry providing communications through a bus interface circuit to the network bus in accordance with a predetermined communications procedure including a series of communications states to be traversed for establishing communications between terminals for making outgoing or receiving incoming calls on the network bus, the terminal communications circuitry comprising:

communications interchange means for exchanging protocol signals with said bus interface circuit, and including:

an electrical interchange means for exchanging protocol signals on a plurality of lines of a single communications channel with the bus interface circuit and exchanging protocol control information with a physical interface means, and

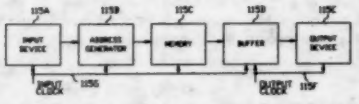
said physical interface means for interpreting said protocol control information received from said electrical interchange means to provide communications state change information to a signal state controller means, and including means for receiving a command from the signal state controller means and providing, in response thereto, an exchange of a sequence of protocol signal patterns to said electrical interchange means for traversing a plurality of said communication states; and

said signal state controller means for executing one of a plurality of program states to control communications over said network bus in accordance with the predetermined communications procedure by providing commands to the communications interchange means in accordance with which program state the signal state controller means is currently executing in response to a request from the terminal for making an outgoing call and for changing the program state in response to communications state change information from said communications interchange means in response to incoming calls.

4,954,951
SYSTEM AND METHOD FOR INCREASING MEMORY PERFORMANCE

Gilbert P. Hyatt, 7841 Jennifer Cir., La Palma, Calif. 90623

Continuation of Ser. No. 279,592, Dec. 2, 1988, and a continuation-in-part of Ser. No. 848,017, Apr. 13, 1986, and Ser. No. 661,649, Oct. 17, 1984, abandoned, said Ser. No. 279,592, is a continuation-in-part of Ser. No. 849,243, Apr. 17, 1986, which is a continuation-in-part of Ser. No. 849,733, Nov. 9, 1977, abandoned, and a continuation-in-part of Ser. No. 425,731, Sep. 28, 1982, Pat. No. 4,581,715, said Ser. No. 848,017, is a continuation-in-part of Ser. No. 425,731, , which is a continuation-in-part of Ser. No. 160,872, Jun. 19, 1980, Pat. No. 4,491,930, Ser. No. 860,257, Dec. 14, 1977, Pat. No. 4,371,923, Ser. No. 101,881, Dec. 28, 1970, abandoned, Ser. No. 134,958, Apr. 19, 1971, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,280,894, Ser. No. 230,872, Mar. 1, 1972, Pat. No. 4,531,182, Ser. No. 232,459, Mar. 7, 1972, Pat. No. 4,370,720, Ser. No. 246,867, Apr. 24, 1972, Pat. No. 4,310,878, Ser. No. 288,247, Sep. 11, 1972, Pat. No. 4,121,284, Ser. No. 291,394, Sep. 22, 1972, Pat. No. 4,396,976, Ser. No. 302,771, Nov. 1, 1972, Ser. No. 325,933, Jan. 22, 1973, Pat. No. 4,016,540, Ser. No. 325,941, Jan. 22, 1973, Pat. No. 4,060,848, Ser. No. 366,714, Jun. 4, 1973, Pat. No. 3,986,922, Ser. No. 339,817, Mar. 9, 1973, Pat. No. 4,034,276, Ser. No. 402,520, Oct. 1, 1973, Pat. No. 4,825,364, Ser. No. 490,816, Jul. 22, 1974, Pat. No. 4,029,853, Ser. No. 476,743, Jun. 5, 1974, Pat. No. 4,364,110, Ser. No. 522,559, Nov. 11, 1974, Pat. No. 4,209,852, Ser. No. 550,231, Feb. 14, 1975, Pat. No. 4,209,843, Ser. No. 727,330, Sep. 27, 1976, abandoned, Ser. No. 730,756, Oct. 7, 1976, abandoned, Ser. No. 754,660, Dec. 27, 1986, Pat. No. 4,486,850. This application Dec. 13, 1988, Ser. No. 283,661
Int. Cl.[5] G06F *12/00*
U.S. Cl. 364—200 96 Claims



1. A memory system comprising:

a memory storing data;

an address generator circuit generating an address having less significant bits and more significant bits;

an accessing circuit coupled to the memory and to the address generator circuit and accessing data stored by the memory in response to the address;

a processor coupled to the accessing circuit and processing data accessed by the accessing circuit;

a detector circuit coupled to the address generator circuit and generating a detector signal in response to detection of a change in the more significant bits of the address generated by the address generator circuit; and

a delaying circuit coupled to the address generator circuit and to the detector circuit and delaying generating of the address by the address generator circuit in response to the detector signal.

4,954,952

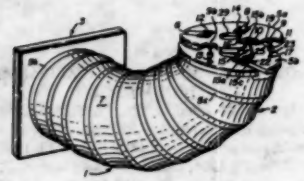
ROBOTIC ARM SYSTEMS

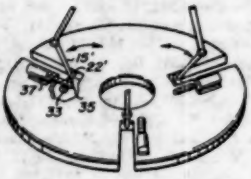
Shivadev K. Ubhayakar, and Robert D. Baker, both of Rancho Palos Verdes, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 156,388, Feb. 16, 1988. This application Oct. 2, 1989, Ser. No. 401,338

Int. Cl.[5] A61F 1/00

U.S. Cl. 364—513 5 Claims





1. In a robotic arm system containing at least one multisection robotic arm each of which arms contain a plurality of spaced platforms and in which at least three actuators are carried between each pair of platforms for positioning one platform relative to the paired platform, whereby the positioning of arm section is selectively changed through energization of the actuators, and control means for selectively energizing said actuators, the improvement comprising in combination therewith:

programmed processor means;

input means for inputting information into said processor means;

said processor means for receiving position information from said input means, calculating actuator displacements to achieve a position for said arm represented by said input information and generating a control signal for causing the actuator to attain the calculated position.

4,954,953

MACHINE PROCESS FOR CONVERTING ONE REPRESENTATION OF AN ELECTRONIC INTEGRATED CIRCUIT INTO ANOTHER REPRESENTATION

Steve Bush, Mountain View, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 7, 1988, Ser. No. 178,574

Int. Cl.[5] G06F 15/20, 15/60

U.S. Cl. 364—578 6 Claims

MICROFICHE APPENDIX INCLUDED

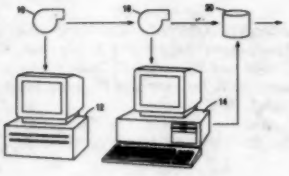
(2 Microfiche, 196 Pages)

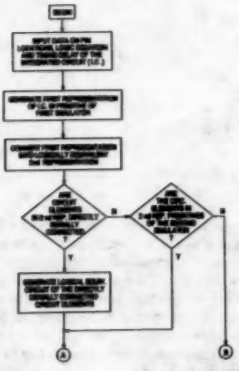
1. A machine process for converting a behavioral representation of an electronic integrated circuit from one form to another form; said behavioral representation of the electronic integrated circuit, in one form, has a plurality of inputs and a plurality of outputs, and a plurality of nodes interconnecting a plurality of logical elements, which are in the primitives of a first simulator; said behavioral representation in another form is generated for further processing by a second simulator and is in the primitives and in the syntax of the second simulator; said machine process being implemented by the use of a programmed digital computer having stored therein a program; said method comprising the steps of:

(a) inputting data on pin locations, logic equation and timing delays from said inputs to said outputs of said electronic integrated circuit, into said program;

(b) generating a first representation of said electronic integrated circuit based upon said data on said pin locations, logic equation and timing delays, said first representation having a plurality of nodes interconnecting a plurality of first electronic logic circuit elements, each of said elements is a primitive of said first simulator;

(c) converting said first representation into a second representation, which is a logical equivalent of said first representation, in accordance with the rules of boolean algebra, and in accordance with the following:





(i) changing representations of all directly serially connected first electronic logic circuit elements into a representation of a second electronic logic circuit element;

(ii) changing said first electronic logic circuit elements into electronic logic circuit elements of said second representation, which are primitives of said second simulation program, but which are not directly serially connected primitives;

(d) determining the timing delay for each electronic logic circuit element of said second representation;

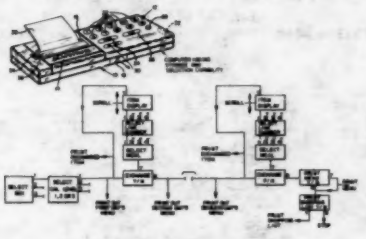
(e) converting said second representation into a third representation by converting all of the electronic logic circuit elements of said second representation into primitives of said second simulation program; and

(f) generating said third representation in the syntax of said second simulation program for further processing by said second simulation program.

4,954,954
APPARATUS FOR GENERATING A BALANCED CALORICALLY LIMITED MENU

Lamar R. Madsen, 1570 East Ave., Vernonia, Oreg. 97064, and Maki Myoga, 7610 SW. Leslie St., Portland, Oreg. 97223

Filed Aug. 26, 1985, Ser. No. 769,353
Int. Cl.[5] G06F 9/00
U.S. Cl. 364—413.29 3 Claims



1. An electronic digital computer for preparing a balanced calorically limited diet, said calculator comprising:

(a) a memory from which data can be retrieved, said memory having stored therein a list of food items, the caloric content of each of said items, in which of a selected number of food groups each of said items resides and the applicability of each of said items for a particular meal;

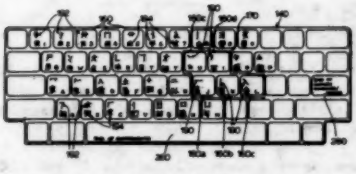
(b) means for generating a daily menu for a selected period of time from said items in said list with eaach meal in said menu only having foods which are applicable for the meal, which are from particular predetermined ones of said food groups and which have particular caloric content; and

(c) means for replacing items in each meal on said menu, with each replacement item being applicable to the same meal, being in the same food group, and having the same caloric content as the item it replaced.

4,954,955
MEANS AND METHOD FOR ELECTRONIC CODING OF IDEOGRAPHIC CHARACTERS

Andrew Chiu, Scarborough, Canada, assignor to Brushwriter Corporation PTE Ltd., Scarborough, Canada

Filed Jul. 14, 1987, Ser. No. 74,999
Claims priority, application Canada, Aug. 18, 1986, 516180
Int. Cl.[5] B41J 5/10
U.S. Cl. 364—419 54 Claims



1. An input apparatus for entering ideographic characters of an ideographic written language into a system, each ideographic character being formed by certain basic written strokes and/or certain written radicals themselves composed of said strokes, said apparatus comprising:

keyboard means having a plurality of entry keys thereon, for representing stroke identification indicia, radicals and complete ideographic characters each said key being operable to produce a unique signal according to the actuation thereof,

in a first form, said signal representing one of the group of:

a. one of a plurality of stroke identification indicia; and,

b. one of a plurality of radicals frequently used in said language;

and, in a second form, said signal representing a complete ideographic character frequently used in said language; said strokes being divided into a plurality of distinct groups with each group assigned one of said stroke identification indicia whereby a given stroke is represented by the assigned stroke identification index, said stroke identification indicia being present in sufficient number and variety to allow any ideographic character to be represented by a series of stroke identification indicia;

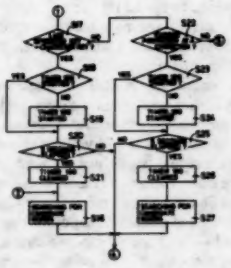
said keyboard means also having a first selection key operable to produce a unique signal to identify a series of entry key actuations as being in said first form representing a complete ideographic character, and a second selection key operable to produce a unique signal to identify an entry key actuation as being in said second form representing a complete ideographic character; and,

interpreter means connected to receive said signals from said keyboard means, said interpreter means being responsive to sequential actuation of said entry keys and said first and second selection keys to generate code signals representing said ideographic characters to be entered.

4,954,956
DATA PROCESSING APPARATUS HAVING FUNCTION OF PROVIDING HELPFUL INFORMATION AFTER EXCESSIVE TIME LAPSE FROM LAST INPUT OPERATION

Kiyoshi Yamakawa, Gifu; Yoshio Sugiura, Aichi, and Satoru Tsuruki, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 10, 1987, Ser. No. 131,405
Claims priority, application Japan, Dec. 13, 1986, 61-297013
Int. Cl.[5] G06F 9/00
U.S. Cl. 364—419 18 Claims



1. A data processing apparatus comprising:

a dictionary memory storing word data representative of a multiplicity of words;

input means including an input device which is capable of entering document data including word data representative of a plurality of words each consisting of at least one character and word separation data indicative of termination of entry of each of said plurality of words;

time-measuring means connected to said input means, for measuring a predetermined time duration during which a data entry operation through said input means is interrupted, said time-measuring means measuring said predetermined time duration while said data entry operation through said input means is possible; and

informing means responsive to said time-measuring means, for providing related word or character information associated with said data entry operation interrupted and

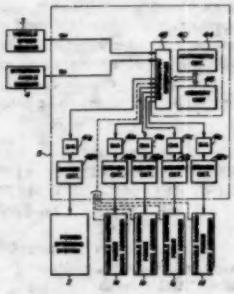
helpful in resuming the interrupted data entry operation, without an operation through said input means by an operator, when said time-measuring means has measured said predetermined time duration.

4,954,957

CONTROL SYSTEM FOR ADAPTING SUSPENSION CHARACTERISTICS AND STEERING CHARACTERISTICS TO VEHICLE DRIVING CONDITION

Kenji Kawagoe; Hideo Ito, and Masatsugu Yokote, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 23, 1989, Ser. No. 301,526
Claims priority, application Japan, Jan. 25, 1988, 63-14127
Int. Cl.[5] B60G *17/00*; B62D *5/00*
U.S. Cl. 364—424.05 **8 Claims**



1. A control system for controlling an automotive suspension system and a power steering system in combination, comprising:

first sensor means for monitoring a vehicular speed for producing a vehicular speed signal;

second sensor means for monitoring steering angular displacement for producing a steering angle signal indicative of offset from a neutral position;

third means, associated with said suspension system for controlling suspension characteristics at least between a first softer suspension mode and a second harder suspension mode on the basis of said vehicle speed signal and said steering angle signal, said third means alters said suspension control characteristics at least between a first suspension control characteristics mode having lower responsive characteristics and a second suspension control characteristics mode having higher response characteristics;

fourth means, associated with said power steering system, for controlling assisting force to be distributed in said power steering system at least between a first smaller assisting force mode and a second greater assisting force mode on the basis of said vehicle speed signal, said fourth means alters the assisting force control characteristics at least between a first assisting force control characteristics mode having lower responsive characteristics and a second assisting force control characteristics mode having higher response characteristics;

fifth means for detecting steering operation pattern matching with a preset reference pattern and counting up the occurrence of the steering operation pattern matching said preset pattern; and

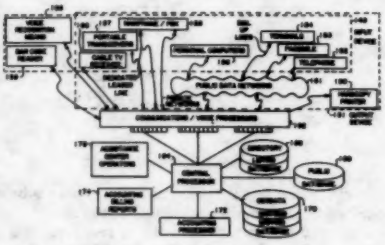
sixth means, periodically operable, for detecting vehicular driving condition on the basis of said vehicle speed signal, said counted value of said fifth means representative of frequency of occurrence of steering behaviour matching with said preset pattern, for setting one of said control characteristics modes correspond to said third and fourth means depending upon said vehicle driving condition.

4,954,958

DIRECTIONAL INFORMATION SYSTEM

Charles Savage, Chester; Frank G. Barone, Jr., Florida; Gregory Demetrious, Chester, all of N.Y., and Vincent Volpe, Haworth, N.J., assignors to Hacowie Corporation, Monroe, N.Y.

Filed Aug. 19, 1988, Ser. No. 234,264
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—444 **15 Claims**



1. A system for providing routing directions for travel between locations, comprising:

data entry means for supplying first identification number data corresponding to a first location and for entering request data comprising a request for directions, said request data including second identification number data corresponding to a second location;

a data processing system, for receiving data from said data entry means, said system including:

(a) a first data base comprising data correlating identification numbers to geographic locations;

(b) a second data base comprising geographic location data and route data;

(c) a direction generating program for generating routing data using supplied location data and said second data base and

(d) an operating program for obtaining location data corresponding to said first and second identification numbers from said first data base, for supplying said location data to said direction generating program and for obtaining said routing data;

and routing direction output means for supplying user understandable routing directions in response to said routing data.

4,954,959

NAVIGATION SYSTEM

Shuzo Moroto; Masao Kawai; Shoji Yokoyama; Koji Kobayashi, and Koji Sumiya, all of Anjo, Japan, assignors to Aisin A W Co. Ltd., Anjo and Kabushiki Kaisha Shinsangyokaihatsu, Toyko, both of, Japan

Filed Dec. 27, 1988, Ser. No. 290,204
Claims priority, application Japan, Mar. 2, 1988, 63-49965
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—449 **17 Claims**

15. A navigation system for a vehicle comprising:

input means for inputting a starting point and destination;

a present position means for determining a present position of said vehicle;

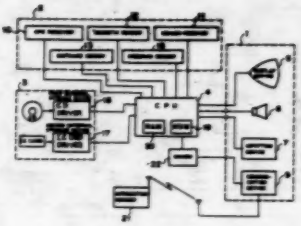
a first external storage means for storing first guidance data including road and intersection data;

a second external storage means for storing second guidance data; said second guidance data being linked to said first guidance data and including more detailed road and inter-

section data associated with a smaller geographic area when compared to said guidance data;

output means for outputting guidance information, including a display means for displaying visual information; and

CPU means for receiving said first and second guidance data



from said first and second external storage means, setting a guide route based on said starting point and said destination including supplementing said first guidance data by said second guidance data, and outputting said guide route as said guidance information together with said present position data via said output means.

4,954,960

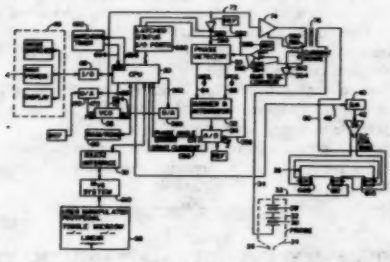
LINEAR POWER CONTROL FOR ULTRASONIC PROBE WITH TUNED REACTANCE

Ying-Ching Lo, Fremont; Samuel Zambre, Palo Alto, and Tolentino Escorcio, San Leandro, all of Calif., assignors to Alcon Laboratories, Fort Worth, Tex.

Continuation-in-part of Ser. No. 928,235, Nov. 7, 1986. This application Apr. 6, 1987, Ser. No. 35,128

Int. Cl.[5] G01H *13/00, 15/00*

U.S. Cl. 364—484 **7 Claims**



1. A method of driving an ultrasonically driven probe having an electronically tunable reactance coupled to said probe comprising the steps of:

generating a driving signal having a frequency within a band of frequencies encompassing the mechanical resonance frequency of said probe;

measuring the relative amount of drive current to said probe resulting from said drive signal at said frequency;

comparing said drive current to a variable which is updated to store the value of the highest drive current at any other drive frequency in said band of frequencies;

if said drive current is higher than said variable, updating the value of said variable with the value of said drive current and recording the frequency of said driving signal that resulted in said new highest drive current;

adjusting the frequency of said driving signal to a new frequency in the band of frequencies and repeating the above steps for the new frequency; and

repeating the step next above until all frequencies in the band of frequencies have been generated and the resulting drive currents measured;

setting the frequency of said driving signal to the frequency in said band of frequencies which resulted in the highest drive current;

measuring the phase angle between said drive current and the driving signal voltage at said frequency which resulted in said highest drive current and comparing said phase angle to a selected margin defining a range of acceptable phase angles;

if said phase angle is outside the range of acceptable phase angles, electronically tuning said reactance to a new value and measuring said phase angle again and comparing said phase angle to said acceptable range of phase angles;

repeating the step next above until said phase angle is within said acceptable range.

4,954,961

METHOD OF DIGITALLY EVALUATING THE FREQUENCY AND THE PHASE OF SIGNALS, AND A DEVICE FOR IMPLEMENTING SUCH A METHOD

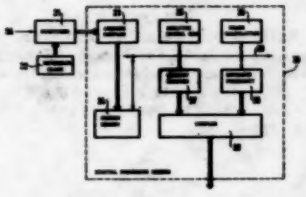
Sylvain Fontanes, Chatou; Patrice Birot, Courbevoie; André Marguinaud, Palaiseau, France; Thierry Quignon, Nanterre, and Brigitte Romann, Boulogne Billancourt, all of Japan, assignors to Alcatel Espace, Courbevoie, France

Filed May 23, 1988, Ser. No. 197,251

Claims priority, application France, May 21, 1987, 87 07130

Int. Cl.[5] G01R *23/00*

U.S. Cl. 364—484 **4 Claims**



1. A method of digitally evaluating at least one desired parameter of an input signal, said input signal being in the form of digitized samples having sample values, wherein the method comprises the steps of:

deriving an analytic signal from said sample values, said analytic signal having a real portion which coincides with said digitized samples;

calculating, in accordance with said sample values, phase values corresponding to the phase of said input signal;

estimating said desired parameter by operating on said phase values without using any operator of the Fourier transform type or any hypothesis test either separately or simultaneously; and

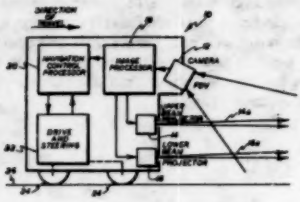
estimating the differences between the real signal as taken in this way and the signal obtained from the estimated parameter, thereby making it possible to deliver data in digital form relating to the quality of the analyzed signal and to the reliability of the estimated values.

4,954,962

VISUAL NAVIGATION AND OBSTACLE AVOIDANCE STRUCTURED LIGHT SYSTEM

John M. Evans, Jr., Brookfield; Carl F. R. Weiman, Westport, and Steven J. King, Woodbury, all of Conn., assignors to Transitions Research Corporation, Danbury, Conn.

Filed Sep. 6, 1988, Ser. No. 241,059
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—513 33 Claims



1. Object detection apparatus carried by a vehicle which moves over a surface, comprising:

means for emitting at least one structured, substantially planar beam of light in a direction of travel of the vehicle, the beam being oriented for forming a substantially stripe-like pattern upon a surface disposed generally in the direction of travel of the vehicle;

means for imaging at least a portion of the planar beam of light which is reflected from at least one surface disposed within a region through which the vehicle is to travel;

means for associating the imaged reflection of the beam of light with at least a range and a bearing, relative to the vehicle, of the surface reflecting the planar beam of light; and

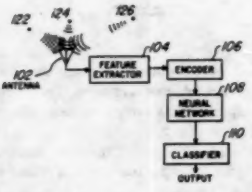
means, coupled to an output of said associating means, for determining vehicle navigation-related information as a function of the range and bearing to the surface.

4,954,963

NEURAL NETWORK AND SYSTEM

Perry A. Penz, and Michael T. Gately, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 2, 1989, Ser. No. 318,038
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 7 Claims



1. An information processor, comprising:

(a) an encoder, said encoder encoding input information into a closeness code format and providing an output in response thereto; and

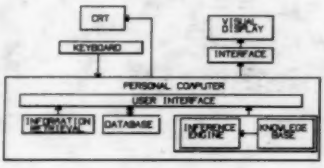
(b) a clustering neural network providing an output therefrom, said clustering network having an input receiving said output of said encoder and said output of said clustering network, said clustering neural network clustering said input thereto with thresholded analog neurons in conjunction with a learning rule and a recall rule to preserve analog aspects.

4,954,964

APPARATUS AND METHOD FOR EXPERT ANALYSIS OF METAL FAILURE WITH AUTOMATED VISUAL AIDE

Gurvinder P. Singh, 9303 Lockridge, San Antonio, Tex. 78250

Filed Nov. 9, 1988, Ser. No. 268,846
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 13 Claims



1. A digital processing system with expert system metal failure analysis, said system comprising

a digital data processing device;

data storage means an electrical communication with said digital data processing device;

knowledge base means carried on said data storage means for identifying a possible mode of failure;

input means in an electrical communication with the digital data processing device;

output means in electrical communication with said digital data processing device;

visual display means for displaying macroscopic or microscopic views of selected metal failures, said visual display means being in electrical communication with said digital data processing device;

expert system means controlling the digital data processing device for requesting and receiving information from a user while displaying at least one of said selected views on the visual display means, said view being associated with at least some of the requests for information;

program means for receiving responses from the user through the input device;

inference engine means for logically correlating said received information with said knowledge base to isolate possible failure modes; and

incident file means carried on said storage means for retaining a record of the information requested and received from the user.

4,954,965

ENHANCED FRAME UTILIZATION FOR CSMA/CD COMMUNICATION PROTOCOL

John M. Johnson, Byron; James A. Rocke, Rochester, both of Minn., and Divakara K. R. Udupa, Durham, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1989, Ser. No. 308,852
Int. Cl.[5] G06K *15/00*; H04L *11/00*
U.S. Cl. 364—514 11 Claims

1. A device for transferring data between nodes coupled to a network having a carrier sense multiple access/collision detect protocol for such data transfer, the device at each node comprising:

means for identifying data records to be transferred to another node;

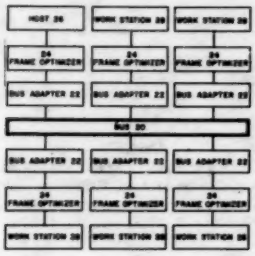
means coupled to the identifying means for generating frames containing data from the data records to be transmitted;

means coupled to the frame generating means for determining when data from a single record is put into more than one different frame to be transmitted:

means coupled to the frame generating means for inserting in

said frames indications to identify the different frames which contain data from the single record;

means coupled to said frame generating means for inserting



in said frames indications to differentiate between data records contained in the same frame; and

means coupled to the identifying means for transmitting said frames to the other node.

4,954,966

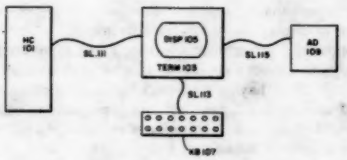
TERMINAL WITH VIEWPORTS, AUXILIARY DEVICE ATTACHMENT, AND HOST-TERMINAL FLAN CONTROL

Robery C. Mooney, Melrose, and Richard J. Peirent, Tewksbury, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Sep. 12, 1986, Ser. No. 907,294

Int. Cl.[5] G06F *3/037*

U.S. Cl. 364—518 **33 Claims**



4. In display apparatus having both a display memory divisible into display positions and an output device for outputting a display divisable into display lines,

means for defining the display comprising:

means for defining a page, the page including a specified set of the display positions;

means for defining a viewport on the output device, the viewport including a specified set of the display lines;

correspondence establishing means for establishing a correspondence between a member of the set of display positions and a member of the set of display lines; and

means for outputting on each display line the contents of any corresponding display positions and when the correspondence establishing means has established no correspondence between any member of the set of display positions and a given member of the set of display lines, outputting certain display data on the given display line,

whereby no correspondence is required between a set of display positions and a member of the set of display lines, permitting the page and the viewport to be defined independently of each other.

4,954,967

INFORMATION PROCESSING APPARATUS

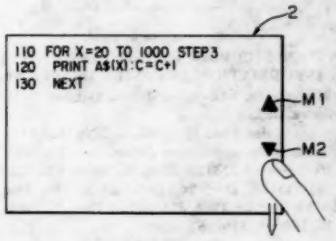
Hiroshi Takahashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 455,908

Claims priority, application Japan, Sep. 21, 1983, 58-173155

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—518 **19 Claims**



1. An electronic apparatus comprising:

display means having a display screen for displaying data;

scrolling means for scrolling said data displayed on said display means in a predetermined direction;

transparent coordinate input means superimposed on said display screen of said display means for receiving input data;

determination means, responsive to actuation of a predetermined position on said transparent coordinate input means, for determining a direction of movement of the data to be scrolled by said scrolling means and for determining a distance of movement of the data to be scrolled by said scrolling means based upon the input data received by said transparent coordinate input means in accordance with variation of the coordinate corresponding to actuation of the position on said coordinate input means; and

control means for inhibiting said scrolling means from scrolling when the scroll direction determined by said determination means is different from said predetermined direction.

4,954,968

INTERFACE SYSTEM FOR PRINT SYSTEM

Ikunori Yamaguchi; Kiyoshi Emori, and Takashi Morikawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1989, Ser. No. 322,933

Claims priority, application Japan, Mar. 16, 1988, 63-62244; Mar. 17, 1988, 63-64886

Int. Cl.[5] G06F *7/00*

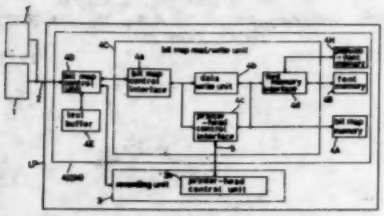
U.S. Cl. 364—519 **31 Claims**

1. In an interface system for receiving from a host computer a series of dot data as print information, and converting the received data to dot information and for providing the same to a printing system, said interface system comprising:

first memory means for storing dot information as column vectors obtained by matrix-transposing row vectors of several series of dot data in advance;

second memory means for storing dot information to be printed over a predetermined print area;

management means for accessing said first memory means to store in said second memory means dot information corresponding to the received dot data; and



output means for outputting said dot information stored in said second memory means in a predetermined order.

4,954,969

SYSTEM FOR PROCESSING VARIOUS TYPES OF INFORMATION IN EASILY USABLE FORM

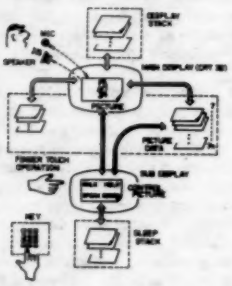
Tomoki Tsumura, Yokohama, Japan, assignor to PFU Limited, Ishikawa, Japan

Filed Dec. 18, 1987, Ser. No. 134,972

Claims priority, application Japan, Dec. 19, 1986, 61-303471; Dec. 26, 1986, 61-313155; Dec. 26, 1986, 61-313156; Dec. 26, 1986, 61-313157; Dec. 26, 1986, 61-313158; Dec. 26, 1986, 313159159; Dec. 26, 1986, 313160160; Dec. 26, 1986, 313161161; Dec. 26, 1986, 313162162

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—521 32 Claims



1. An image information processing system having a display unit, comprising:

data receiving means for receiving and providing image data;

image data-base means, operatively connected to said data receiving means, for highly compressing the image data from said data receiving means and storing the highly compressed image data;

high-speed image data-base means, operatively connected to said image data-base means, for storing data from said image data-base means in a high-speed compressed form;

a buffer memory, operatively connected to said image data-base means and said high-speed image data-base means, storing data;

request input means, operatively connected to said image data-base means, said high-speed image data-base means and said buffer memory, for receiving requests and outputting data in response to the requests; and

area blocking means for blocking an area of display on the display unit and producing picture data including image data, mask data and control data in accordance with the block area.

4,954,970

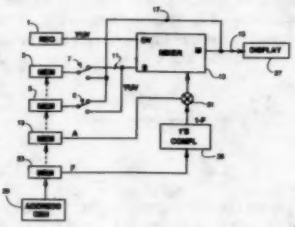
VIDEO OVERLAY IMAGE PROCESSING APPARATUS

James T. Walker, 224 Seale Ave., Palo Alto, Calif. 94301, and Marvin L. Kausch, 2790 Wexford Dr., San Jose, Calif. 95132

Filed Apr. 8, 1988, Ser. No. 179,565

Int. Cl.[5] G06F *15/66*

U.S. Cl. 364—521 31 Claims



1. In a system for producing, controlling and manipulating a background image and a first overlay image for simultaneous display on a raster-type display device,

a first addressable memory means for storing data representing the density pattern of said overlay image at a plurality of points along each of the raster lines of said raster-type display device;

a register means for storing data representing a color to be used in displaying said overlay image;

a proportional mixer means, having a first input coupled to said first memory means to receive said overlay image density data, having a second input coupled to receive said background image as data representing said background image at said plurality of points along each of the raster lines of said raster-type display device, having a register input coupled to receive color data from said register, and having a display output for connection to said display device, for producing in response to said first, second and register inputs a composite display output image having said overlay image in said selected color mixed into said background image at each of said plurality of points in proportion to the density of color represented by said overlay image density data;

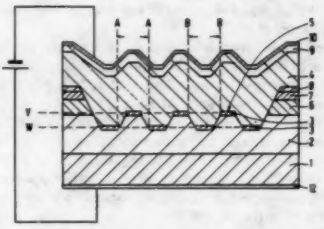
a second addressable memory means for storing a second image as data representing said second image at said plurality of points along each of the raster lines of said raster-type display device, said second addressable memory means being coupled to said second mixer input to supply said second image as said background image, and being coupled to said mixer display output to store said output image therefrom as a succeeding second image;

first clock-driven address generator means coupled to each of said memory, register, and mixer means to synchronously cause: (1) said overlay and background image data to be serially presented at said first and second mixer inputs, respectively, and (2) said display output image data to be serially stored in said second memory means.

4,954,971
BIDIMENSIONAL LASER ARRAY WITH TWO GROUPS OF ACTIVE REGIONS

Jan Opschoor; Carolus J. van der Poel, and Henri F. J. van 't Blik, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Feb. 23, 1989, Ser. No. 315,010
Claims priority, application Netherlands, Feb. 29, 1988, 8800509
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—50 7 Claims

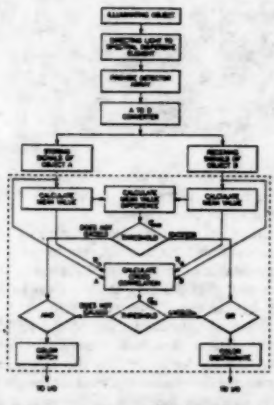


1. A semiconductor diode laser array comprising a semiconductor layer structure arranged on a substrate and having two electrical contacts, two enclosure layers and a number of substantially parallel strip-shaped active regions each located between said two electrical contacts and between said two enclosure layers, said enclosure layers having a larger band gap and a smaller refractive index for the radiation produced than the active region, which active regions are disposed within a resonant cavity and constitute at least two groups located in two substantially equidistant planes, at least one of the groups comprising at least two active regions, characterized in that the active regions of one group are fully separated by at least one of the enclosure layers from the active regions of the other group.

4,954,972
COLOR SIGNATURE SENSOR

Charles T. Sullivan, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 9, 1987, Ser. No. 118,585
Int. Cl.[5] G06F 15/70; G01J 1/18
U.S. Cl. 364—526 4 Claims



4. A method for comparing color of an object B as compared with color of a reference A comprising the steps of:

providing optical path means for observing a colored reference object A and directing light therefrom to a spectral dispersive element;

providing a spectral dispersive element for spectrally dispersing light received on the optical path;

providing a detector array for receiving the spectrally dispersed light and converting it to a set of analog electrical signals;

receiving and converting a set of analog signals representative of color of the reference A to a set of digital signals;

storing the digital signals, representative of the reference color A, described collectively as an ordered sequence of weighted numbers representing the unnormalized spectral constitution of the colored object A;

receiving and converting similarly a set of signals representative of object color B, described collectively as an ordered sequence of weighted numbers representing the unnormalized spectral constitution of the colored object B;

determining mean-values of said digital sets of signals;

determining cross-correlation between said sets of signals;

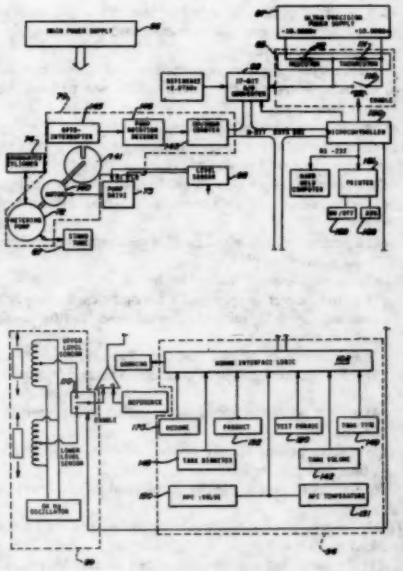
determining mean-value difference between the first and second set of signals;

providing a discrimination threshold for cross-correlation and providing a discrimination threshold for mean-value difference; and, comparing object A and object B correlations and mean-value difference values whereby two colors can be discriminated.

4,954,973
MICROPROCESSOR BASED TANK TEST MANAGEMENT SYSTEM

Allan S. Jacob, Rochester Hills, and Andrzej Zawadzki, Birmingham, both of Mich., assignors to Heath Consultants Incorporated, Stoughton, Mass.

Filed Mar. 29, 1988, Ser. No. 174,762
Int. Cl.[5] G01M 3/38; G01F 23/10
U.S. Cl. 364—551.01 37 Claims



31. A system for testing the tightness of a fluid tank having

a fill pipe to determine the rate of leakage therefrom, said system including:

(a) means to circulate a fluid in said tank to equalize the temperature thereof;

(b) means to stabilize the shape of said tank;

(c) means to measure the change in temperature of the fluid in said tank;

(d) means to determine the coefficient of expansion of the fluid in said tank;

(e) means to determine if any fluid has leaked from said tank to provide the rate of leakage;

(f) said means to stabilize the shape of the tank includes means to establish and maintain a constant static fluid head in communication with the fluid in said tank;

(g) said means to establish and maintain a constant static fluid head includes,

(1) a standtube in fluid communication with said tank;

(2) means to measure the fluid added to or removed from said standtube to maintain said static fluid head constant; and,

(3) a small granduated cylinder in fluid comunication with said standtube;

(h) said means to circulate a fluid in said tank includes,

(1) a probe assembly insertable into said tank through the fill pipe thereof;

(2) a pump connected to said probe assembly; and,

(3) said pump having an inlet and an outlet connected to said probe assembly;

(i) said probe assembly includes:

(1) and inlet tube; and,

(2) a discharge tube disposed coaxially inside said inlet tube;

(j) said discharge tube is disposed proximate the bottom of said tank and has a discharge nozzle proximate the end thereof, directed at approximately a 45 degree angle from the bottom of the tank to be tested;

(k) said probe assembly has a seal adaptor disposed proximate the top thereof to seal the probe assembly into said fill pipe;

(l) a system controller;

(m) a power supply connected to said system controller;

(n) a metering system connected to said power supply and said system controller;

(o) a level sensor system connected to said system controller;

(p) a temperature sensor system connected to said system controller;

(q) said system controller further includes,

(1) a microprocessor and an analog-to-digital converter connected to said power supply;

(2) a level detector connected to said power supply;

(3) a human interface connected to said power supply; and,

(4) a printer interface and printer mechanism connected to said power supply;

(r) said power supply further includes,

(1) a first power supply and a second power supply connected to said microprocessor and analog-to-digital converter;

(2) a third power supply connected to said level detector;

(3) a fourth power supply connected to said human interface;

(4) a fifth power supply connected to said metering system;

(5) a sixth power supply connected to said printer interface and printer mechanism; and

(6) a seventh power supply connected to said level detector;

(s) said means to establish and maintain a constant static fluid head includes,

(1) the metering system connected to said level detector and said fifth power supply; and,

(2) the level sensor system connected to said level detector;

(t) said microprocessor and analog-to-digital converter further includes,

(1) a control bus;

(2) a data bus;

(3) a microcontroller connected to said data bus; and,

(4) a 17-bit analog-to-digital converter connected to said microcontroller, said control bus and said data bus;

(u) said level sensor means further includes,

(1) an upper level sensor; and,

(2) a lower level sensor; and,

(v) said level sensor means further includes,

(1) a sine wave oscillator having an an output, said output connected to said upper level sensor and said lower level sensor;

(2) a test phase switch having at least a third position and a fourth position, said third position being connected to said upper level sensor and said fourth position being connected to said level sensor;

(3) a sensor operational amplifier being connected to a center tap of said test phase switch;

(4) a phase discriminator having inputs and a high and lower output, the inputs of said phase discriminator being connected to said sensor operational amplifier and said sine wave oscillator;

(5) a first noise reduction circuit connected to the high output of said phase discriminator;

(6) a first operation amplifier connected to said first noise reduction circuit;

(7) a second noise reduction circuit connected to the low output of said phase discriminator; and,

(8) a second operational amplifier connected to said second noise reduction circuit.

4,954,974

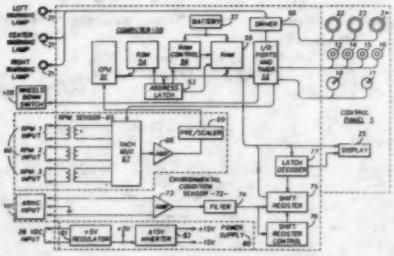
TURBINE ENGINE FAN SPEED MONITOR

John S. Howell, IV, Warson Woods, Mo.; Kenneth P. Widner, and Gary D. Guenther, both of Fort Worth, Tex., assigners to Howell Instruments, Inc., Fort Worth, Tex.

Filed Dec. 15, 1988, Ser. No. 284,710

Int. Cl.[5] G08B *21/00*

U.S. Cl. 364—551.01 **15 Claims**



1. A turbine fan speed monitor for use with at least one aircraft engine having a rotating turbine fan with a variable overspeed limit value comprising:

an RPM sensor for continually detecting actual fan rotational speeds of at least one aircraft engine;

an environmental condition sensor for continually detecting environmental data defining at least total air temperature, pressure altitude and altitude rate; and

a computer, electrically connected to the RPM sensor and the environmental condition sensor, for recording the actual fan speeds, for recording the environmental data, for determining overspeed limit values for each monitored aircraft engine as a function of the environmental data, and for comparing the overspeed limit values with the actual fan rotation speeds, the computer including memory means for recording at least the frequency of the

actual fan speeds exceeding the overspeed limit values for each monitored engine.

4,954,975

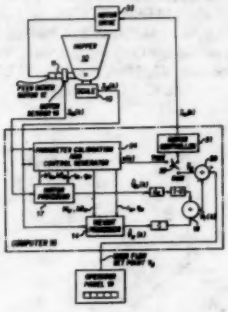
WEIGH FEEDING SYSTEM WITH SELF-TUNING STOCHASTIC CONTROL AND WEIGHT AND ACTUATOR MEASUREMENTS

Paul R. Kalata, Cherry Hill, N.J., assignor to K-Tron International, Inc., Pitman, N.J.

Filed Aug. 10, 1988, Ser. No. 230,415

Int. Cl.[5] G01G *13/00*; B67D *5/14*

U.S. Cl. 364—567 **10 Claims**



2. A weigh feeding apparatus comprising:

means for storing a quantity of material;

means for discharging material from said means for storing, including a material discharge actuator;

means for sensing a weight of said quantity of material or a weight of material being discharged;

means for detecting a position or a velocity of said material discharge actuator;

means, including a model of at least one noise process which causes said sensed weight to differ from an actual weight of stored material or an actual weight of material being discharged, for estimating a first rate of material being discharged according to said sensed weight;

means, including a model of at least one noise process which causes said detected position or velocity to differ from an actual position or velocity of said material discharge actuator, for estimating a second rate of material being discharged, according to said detected position or velocity of said material discharge actuator;

means for combining said first and second rates to produce an estimated total rate of material being discharged; and

means for controlling said material discharge actuator in accordance with said estimated total rate of material being discharged, to discharge material from said means for storing at a desired material discharge rate.

4,954,976

METHOD FOR SIMULATING DYED FABRIC

Kevin K. Noonan, Kortrijk, Belgium, assignor to Sophis Systems N.V., Kortrijk, Belgium

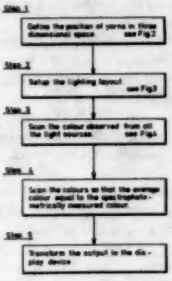
Filed Aug. 8, 1988, Ser. No. 229,469

Claims priority, application Netherlands, Aug. 6, 1987, 8701858

Int. Cl.[5] G06F *15/70*

U.S. Cl. 364—578 **6 Claims**

1. Method for simulating a dyed fabric having dyed yarns woven into each other and each comprising interrupted pieces of particular yarn shape at a surface perceptible to the eye, comprising simulating a position and an illumination condition for said yarn shapes, forming a visual representation of colors visible at points on the surface of said yarn shapes, spectrophotometrically measuring a color of an actual yarn shape to be simulated, summing and correcting values representative of colors in said visual representation such that each simulated



yarn shape has an average color approximately the same as the spectrophotometrically measured color of the actual yarn shape, and displaying an image of the simulated dye fabric on a display device.

4,954,977

PEDAGOGIC CALCULATING MACHINE FOR ARITHMETIC INSTRUCTION

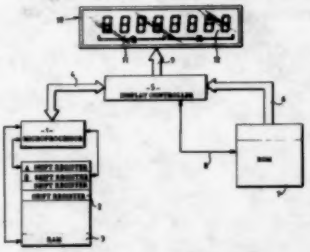
Hubert Colombat, Villeneuve-Loubet, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 12, 1988, Ser. No. 231,733

Claims priority, application France, Sep. 13, 1987, 87 11552

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—710.03 **7 Claims**



1. An electronic data processing apparatus for providing educational instruction in arithmetical operations, said electronic data processing apparatus comprising:

first memory means for receiving data representative of respective numerals on which selected arithmetic operations involving the numerals are to be carried out;

processor means operably connected to said first memory means for controlling the arithmetic operations carried out with respect to data representative of respective numerals stored in said first memory means;

data input means operably connected to said first memory means and to said processor means for entering data into said first memory means to include respective numerals and to select an arithmetic operation involving the entered numerals to be carried out by said processor means;

display means providing a display screen subject to variable background visual representations respectively corresponding to one of a plurality of mathematical procedure modes;

said display screen in a first one of said plurality of mathematical procedure modes having at least first and second independent zones thereon, said first zone being adapted to display the quotient integer of an arithmetic Euclidean division problem, and said second zone being adapted to display the remainder number of the arithmetic Euclidean division problem;

display controller means operably interposed between said display means and said processor means and respectively connected thereto for regulating the operation of said display means in providing a visual representation on said display screen;

second memory means containing program instructions and being operably connected to said display controller means;

said data input means including a plurality of mathematical procedure mode keys for selective actuation to designate to said processor means the selected arithmetic operation to be carried out by said apparatus;

said display controller means having a plurality of alternative display sequence means for respectively imparting to said display screen variable mathematical procedure background graphics in response to program instructions from said second memory means and to command signals from said processor means dependent upon the data entered by said data input means; and

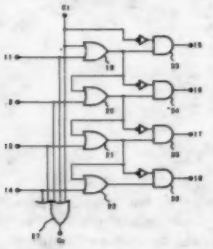
said display controller means having at least a first alternative display sequence means for imparting to said display screen said at least first and second independent zones thereon in a mathematical procedure mode corresponding to the display of an arithmetic Euclidean division problem.

4,954,978

PRIORITY ORDER DECOMPOSING APPARATUS

Hideyuki Terane, and Shinichi Nakagawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,415
Claims priority, application Japan, Jan. 12, 1988, 63-5294
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—715.1 **4 Claims**



1. A priority order decomposing apparatus for processing input data having a plurality of logic circuits comprising:

m number of first inclusive-or circuits respectively receiving one bit of a m-bit word as a first input,

m number of exclusive-or circuits respectively receiving outputs of said first inclusive-or circuits, and

a second inclusive-or circuit receiving m number of said first input and a one-bit second input as inputs thereof,

wherein the first inclusive-or circuit and the exclusive-or circuit of the highest-order bit receive the second input as the other input, and

the other first inclusive-or circuits and exclusive-or circuits receive the output of the first inclusive-or circuit of the high-order-bit side as the other input thereof,

the logic circuits being connected in a cascade manner with the output of the second inclusive-or circuit received as the second input of the logic circuit of the low-order-bit side and the first input of the logic circuit of the highest-order-bit side set to a predetermined potential, and

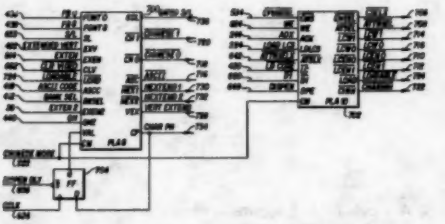
the input data is received as the first input, and the output of said exclusive-or circuit is transmitted as a processed output.

4,954,979

PERSONAL COMPUTER WITH MULTIPLE INDEPENDENT CRT DISPLAYS OF IDEOGRAPHIC AND/OR ASCII CHARACTERS HAVING LOADABLE FONT MEMORY FOR STORING DIGITAL REPRESENTATIONS OF SUBSET OR SPECIAL CHARACTERS

Jules A. Eibner, Dresher, and Jean-Pol Zandel, Berwyn, both of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 22, 1985, Ser. No. 767,399
Int. Cl.[5] G06F *12/02*
U.S. Cl. 364—900 **12 Claims**



1. In a display system including a font memory for storing the digital video representations of the characters comprising a font of standard characters, a character memory for storing a subset of characters which is to be displayed, means responsive to said character memory for addressing said font memory to read therefrom the digital video representations of the subset, and display means responsive to said font memory for displaying said subset, the improvement comprising:

a loadable font memory for storing the digital video representations of special characters, said loadable font memory having an output connected to said display means;

means responsive to said character memory for addressing said loadable font memory whereby digital video representations of special characters are applied to said display means; and,

computer means and means responsive to said computer means for addressing said loadable font memory and applying data signals corresponding to said digital video representations thereto.

4,954,980

HIGH SPEED INPUT/OUTPUT MODULE AND PROGRAMMABLE LOGIC CONTROL DEVICE

Takashi Yamauchi, Minamitsuru, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

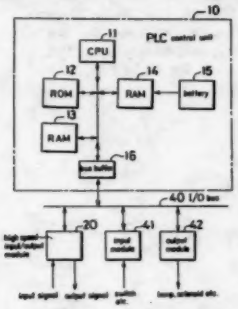
PCT No. PCT/JP88/00789, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO89/01656, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 10, 1988, Ser. No. 330,088
Claims priority, application Japan, Aug. 12, 1987, 62-201597
Int. Cl.[5] G06F *3/00*
U.S. Cl. 364—900 **5 Claims**

1. A high speed input/output module for a programmable logical control (PLC) device and a numerical control apparatus, comprising:

programmable logic control means;

a programmable logical operation element, operatively connected to said programmable logic control means, for

executing a logical operation at high speed in response to an external input signal and an output from said programmable logic control means, for externally outputting a result of the logical operation, and for inputting a result to said programmable logic control means;



at least one input module, operatively connected to said programmable logic control means, for receiving signals which must not be executed at high speed; and

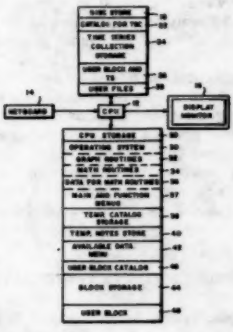
at least one output module, operatively connected to said programmable logic control means, for outputting signals at low speed from said programmable logic control means.

4,954,981

METHOD AND APPARATUS FOR ACCESSING AND MANIPULATING TIME SERIES

Charles V. Dehner, Jr., Lenexa, Kans., and Theodore E. Kihn, Kansas City, Mo., assignors to CoWorks, Kansas City, Mo.

Filed Sep. 16, 1988, Ser. No. 245,908
Int. Cl.[5] G06F *15/401*
U.S. Cl. 364—900 **76 Claims**



1. A system for facilitating a user accessing and manipulating time series comprising:

first means for storing a plurality of blocks of time series each of which blocks contains a number of time series;

means for cataloging said time series in a hierarchial multi-level menu form by subject matter,

means responsive to a user access request for providing the user a first subject matter menu from said cataloging means;

means response to a user selection from the first and each successive subject matter menu for providing the user a successive level of subject matter menu;

means responsive to a user selection from a predetermined menu level for providing the user with time series identifications for a block stored in said first storing means;

second means for storing a plurality of time series, a predetermined area of said second storing means having capacity to store a number of time series and being designated as a user area;

means responsive to a user selection from the time series identifications for a block for transferring selected time series from the first storing means to the second storing means;

means responsive to user requests for performing predetermined functions on one or more time series stored in said second storing means;

means for storing the results of each function performed in said user area;

means for cataloging time series stored in said user area; and

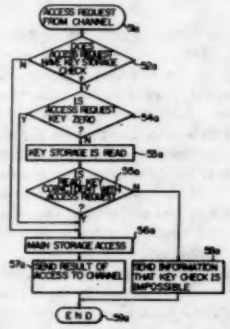
means for selectively transferring time series stored in said user area to said first storing means.

4,954,982

METHOD AND CIRCUIT FOR CHECKING STORAGE PROTECTION BY PRE-CHECKING AN ACCESS REQUEST KEY

Terutaka Tateishi; Minoru Koshino, both of Kanagawa, and Kazuyuki Shimizu, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 75,258, Jul. 16, 1987, abandoned, which is a continuation of Ser. No. 533,988, Sep. 20, 1983, abandoned. This application Feb. 24, 1989, Ser. No. 315,213
Claims priority, application Japan, Sep. 29, 1982, 57-170080
Int. Cl.[5] G06I *12/14*
U.S. Cl. 364—900 **9 Claims**



1. A method for checking storage protection in a system having a channel processor, a CPU, an access control unit, which receives access requests, each one of the access requests having an access key, from both the channel processor and the CPU, a main storage control unit operatively connected to a main storage having storage regions, a storage-protection key control circuit operatively connected to a key storage, and a storage-protection check circuit, the key storage storing storage keys, each one of the storage keys corresponding to a unit area of a storage region, said method comprising the steps of:

(a) pre-checking, using the storage-protection check circuit, value of the access key by which access is requested following an access request before accessing the main storage and the key storage;

(b) accessing the main storage directly without using the storage protection key control circuit and without accessing the key storage when the storage-protection check circuit determines that the access key has a predetermined value;

(c) accessing the key storage to obtain one of the storage

keys when the storage-protection check circuit determines that the access key does not have the predetermined value;

(d) comparing the accessed storage key and the access request key to obtain a coincidence signal if the accessed storage key and the access request key coincide; and

(e) accessing, after said accessing in step (c), the main storage based upon obtaining the coincidence signal.

4,954,983

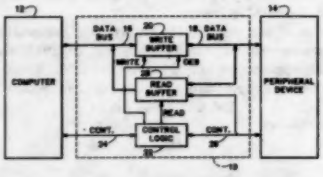
DATA DRIVER FOR MULTIPLE MODE BUFFERED PROCESSOR-PERIPHERAL DATA TRANSFER WITH SELECTIVE RETURN OF DATA TO PROCESSOR

Kayla R. Klingman, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 13, 1987, Ser. No. 107,203

Int. Cl.[5] G06F *3/00, 13/12, 13/42*

U.S. Cl. 364—900 **7 Claims**



1. A data transfer driver for transferring data between a data processing device and a peripheral device comprising:

write buffer means for receiving a parallel data word comprising a plurality of parallel data bytes transmitted thereto by said data processing device, wherein each of said parallel data bytes comprises a plurality of bits, and for separately transmitting each of said plurality of parallel data bytes to said peripheral device at successive times, reception of said data word and transmission of each of said data bytes by said write buffer means being controlled by write buffer control signals applied as input to said write buffer means; and

control means for receiving a first handshaking signal from said data processing device indicating when said data processing device has transmitted said parallel data word to said write buffer means, a second handshaking signal from said peripheral device indicating when said peripheral device is ready to receive a data byte, and a mode selection control signal initiated by said data processing device, said control means operating selectively in one of handshaking and streaming modes in accordance with said mode selection control signal, such that when operating in said handshaking mode said control means generates in response to said first handshaking signal said write buffer control signals to cause said write buffer means to receive said parallel data word after said data processing device has transmitted said data word and to cause said write buffer means to transmit said data bytes in sequence to said peripheral device only when said second handshaking signal indicates said peripheral device is ready to receive a data byte, and such that when operating in said streaming mode said control means generates said write buffer control signals to cause said write buffer means to periodically transmit data bytes to said peripheral device regardless of whether said second handshaking signal indicates said peripheral device is ready to receive a data byte.

4,954,984

METHOD AND APPARATUS FOR SUPPLEMENTING TRANSLATION INFORMATION IN MACHINE TRANSLATION

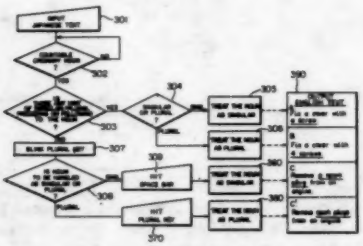
Ryota Kaijima, Tokyo; Hirokazu Ihara, Machida; Yoshihiko Nitta, Sagamihara, and Hiroyuki Kaji, Tama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,539

Claims priority, application Japan, Feb. 12, 1985, 60-24623

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—900 **25 Claims**



1. A method for supplementing translation information for a translation machine for sentences, wherein the translation machine includes a CPU and a memory storing a translation dictionary and translation rules and grammar used to translate the sentences of a first language text to a second language text, a keyboard for inputting characters, numbers and symbols, a function-keyboard including means for indicating a type of information necessary for a translation but not directly expressed in the first language text, and a displaying device for displaying a translated text and information necessary for the translation, comprising the steps of:

(a) detecting by the CPU ambiguous portions regarding number or sex of a noun or meaning of a particle in the first language text;

(b) checking by the CPU if said ambiguous portions can be interpreted by analyzing expressions of the first language text before or after said ambiguous portions detected by the CPU;

(c) displaying possible candidates for a translation regarding number or sex of a noun or meaning of a particle on the displaying device when it is determined by the CPU that said ambiguous portions cannot be completely interpreted by the CPU; and

(d) generating a translation corresponding to said ambiguous portions in response to an operator's selection by said keyboard of one of said displayed candidates.

4,954,985

FERROELECTRIC LIQUID CRYSTAL DATA STORAGE CARD

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed May 9, 1988, Ser. No. 192,016

Claims priority, application Japan, May 9, 1987, 62-113248; May 9, 1987, 62-113249; May 13, 1987, 62-117281

Int. Cl.[5] G11C *13/04*

U.S. Cl. 365—108 **20 Claims**

11. A card memory comprising:

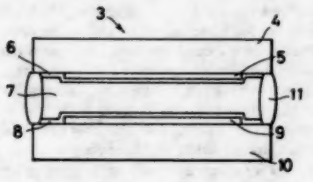
a pair of substrates wherein at least a portion of one of said substrates is transparent;

a ferroelectric liquid crystal layer interposed between said substrates, said ferroelectric liquid crystal layer comprising a first portion and a second portion, said first portion being located to receive light rays through the transparent portion of at least one of said substrates;

a first electrode arrangement formed on the inside surfaces

of said pair of substrates and located on both sides of the first portion of said liquid crystal layer in order to constitute a liquid crystal display by said first electrode arrangement and said first portion of said ferroelectric liquid crystal layer; and

a second electrode arrangement formed on the inside surfaces of said pair of substrates and located on both sides of said second portion of said liquid crystal layer in order to constitute a non-volatile liquid crystal memory by said second electrode arrangement and said second portion of said ferroelectric liquid crystal layer, wherein information is stored in terms of the bistability of said liquid crystal layer.



4,954,986

METHOD AND APPARATUS FOR STORING DIGITAL DATA REPRESENTING A TOPOLOGICAL NETWORK

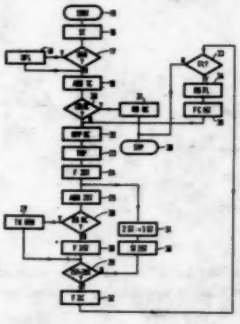
Leonardus M. H. E. Driessen, and Cornelis P. Janse, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 224,087

Claims priority, application Netherlands, Jul. 23, 1987, 8701738

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—189.01 **10 Claims**



1. A method for storing digital data of a surface-wise-organized topological network in a memory, which network contains a set of 0-cells and 1-cells, each given 1-cell having a memory location for storing data representing a first and a second 0-cell terminating said given 1-cell, inclusive of a thread pointer data per 0-cell, that indicates a single further 1-cell terminated by the 0-cell in question, each given 0-cell terminating a subset of 1-cells arranged in a sequence of successive orientations, characterized in that said thread pointer data indicates a 1-cell of next-following orientation in the subset according to a particular sense of rotation, and in that said sense is uniform for all 0-cells in the set.

4,954,987

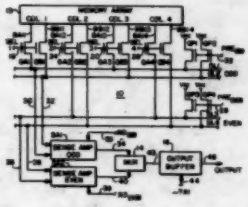
INTERLEAVED SENSING SYSTEM FOR FIFO AND BURST-MODE MEMORIES

Stuart T. Auvinen, Santa Cruz, and Barry A. Huberman, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 17, 1989, Ser. No. 380,368

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—189.02 **20 Claims**



1. An interleaved sensing system for decreasing the read access time in a sequential memory, comprising in combination:

a sequential memory array formed of a plurality of memory cells for storing data, said memory cells being arranged in a plurality of odd columns and a plurality of even columns;

odd bit line means coupled to said plurality of odd columns;

even bit line means coupled to said plurality of even columns;

odd selecting means responsive to odd column select signals and coupled to said odd bit line means for accessing and transferring the stored data in selected ones of said memory cells in said odd columns to a pair of odd data lines;

even selecting means responsive to even column select signals and coupled to said even bit line means for accessing and transferring the stored data in selected ones of said memory cells in said even columns to a pair of odd data lines;

odd precharging means responsive to an odd precharging signal for precharging said pair of odd data lines prior to the transferring of the stored data in said odd columns to said pair of odd data lines;

even precharging means responsive to an even precharging signal for precharging said pair of even data lines prior to the transferring of the stored data in said even columns to said pair of even data lines;

odd sensing means coupled to said pair of odd data lines for sensing said stored data in said odd columns and for generating an odd output signal in response to an odd read signal;

even sensing means coupled to said pair of even data lines for sensing said stored data in said even columns and for generating an even output signal in response to an even read signal;

multiplexing means coupled to said odd and even sensing means for alternately supplying said odd output signal and said even output signal in a predetermined timing relationship; and

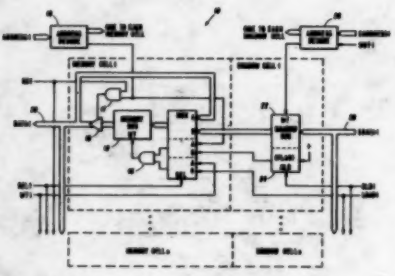
output means coupled to said multiplexing means for generating output data representing alternately said stored data in said odd and even columns in response to a read transfer signal.

4,954,988

MEMORY DEVICE WHEREIN A SHADOW REGISTER CORRESPONDS TO EACH MEMORY CELL

James R. Robb, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 28, 1988, Ser. No. 264,465
Int. Cl.[5] G11C *19/00*
U.S. Cl. 365—189.02 **15 Claims**



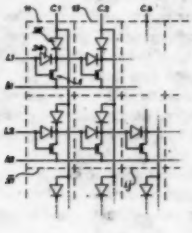
1. A data storage device for use with a data bus, comprising:
a plurality of memory cells;
a plurality of shadow registers, each of said shadow registers connected to a corresponding one of said memory cells; and
a plurality of multiplexers connected between corresponding ones of said memory cells and shadow registers for gang loading data from said shadow registers into said corresponding memory cells, each of said multiplexers having a first channel connected to the data bus and a second channel connected to said corresponding shadow register, said second channel for loading data from said shadow register into said memory cell.

4,954,989

MIS TYPE STATIC MEMORY CELL AND MEMORY AND STORAGE PROCESS

André-Jacques Auberton-Herve, St Egreve, and Benoit Giffard, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Apr. 10, 1989, Ser. No. 335,732
Claims priority, application France, Apr. 12, 1988, 88 04815
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—177 **8 Claims**



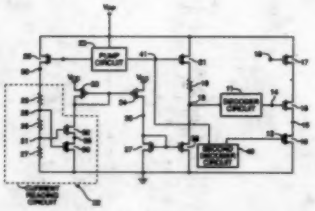
1. Static memory cell comprising:
(A) a bistable flip-flop (1) essentially formed by a MOS transistor (20) and a parasitic bipolar transistor (22) formed by the structure of a MIS transistor, a source (8) and drain (12) of the MIS transistor respectively constituting the emitter and the collector of the bipolar transistor, the region of the p-channel (10) of the MIS transistor between the source and drain serving as the base for the bipolar transistor, said base being electrically isolated from the direct connection to exterior of the memory cell, a gate electrode (16) of the MIS transistor being electrically isolated from the channel (10) region and
(B) an addressing circuit (23,25) for the flip-flop in order to apply with respect to the source (8) raised to a reference potential:
(a) to the gate electrode (16) a voltage VG1 below a first threshold voltage VBi for triggering the bipolar transistor by the MIS transistor (20) and to the drain a voltage VD1 above a second threshold voltage VD0 for maintaining the bipolar transistor (22) in the triggered state in order to maintain a state with value of "0" or "1",
(b) to the drain (12) the voltage VD1 and to the gate electrode (16) a voltage VG2 higher than VBi or a pulse of illuminating white light, having a power of magnitude 1 $\mu W/\mu/m^{22}$ adequate for triggering the MIS and bipolar transistors, in order to write the state "1", followed by the voltage VG1,
(c) to the gate electrode (16) the voltage VG1 and to the drain (12) a voltage VD2 lower than VD0, in order to write the state "0" and then the voltage VD1.

4,954,990

PROGRAMMING VOLTAGE CONTROL CIRCUIT FOR EPROMS

Dov-Ami Vider, Sunnyvale, Calif., assignor to Cypress Semiconductor Corp., San Jose, Calif.

Filed May 30, 1989, Ser. No. 358,558
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—185 **6 Claims**



1. Apparatus for controlling the programming voltage of an EPROM array having a plurality of programmable floating gate MOS cells, comprising:
an additional floating gate MOS cell fabricated on the same chip in the same manner as said plurality of programmable floating gate cells, said additional cell not being connected for programming during normal programming of said array;
means for applying a voltage to said additional cell in order to generate a drain current through said additional cell;
feedback means coupled to a source of programming voltage for said array which uses the amplitude of said drain current in said additional cell to control the magnitude of said programming voltage in such a manner that when said drain current increases, said programming voltage proportionately decreases.

4,954,991

SEMICONDUCTOR MEMORY WITH P-CHANNEL LOAD TRANSISTOR

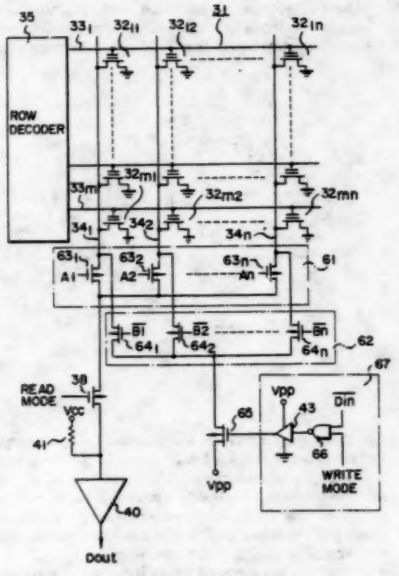
Yukihiro Saeki, and Toshimasa Nakamura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 94,706, Sep. 9, 1987. This application Dec. 7, 1989, Ser. No. 447,391

Claims priority, application Japan, Sep. 30, 1986, 61-231721; Sep. 30, 1986, 61-231803

Int. Cl.[5] G11C 7/00, 11/409, 16/06

U.S. Cl. 365—189.01 6 Claims



1. A semiconductor memory device comprising:

a cell matrix comprising a plurality of floating gate, MOS transistors arranged in rows and columns, and used as memory cells;

a plurality of row lines equal in number to the rows of memory cells, one row line being connected to the gate of each of the memory cells of the corresponding row;

a plurality of column lines equal in number to the columns of memory cells, one column line being connected to the drain of each of the memory cells of the corresponding column;

a data-writing, column-selecting circuit including a plurality of p-channel MOS transistors connected at one end to said column lines, respectively, and controlled by data-writing, column-decode signals;

a data-reading, column-selecting circuit including a plurality of n-channel MOS transistors connected at one end to said column lines, respectively, and controlled by data-reading, column-decode signals; and

a data-writing, p-channel MOS transistor connected to the other ends of the p-channel MOS transistors of said data-writing, column-selecting circuit, for applying a high voltage to those memory cells selected and turned on when the semiconductor memory is set in level "0" data-writing mode.

4,954,992

RANDOM ACCESS MEMORY HAVING SEPARATE READ OUT AND WRITE IN BUS LINES FOR REDUCED ACCESS TIME AND OPERATING METHOD THEREFOR

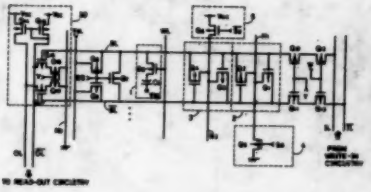
Masaki Kumanoya; Hirofumi Shinohara; Katsumi Dosaka; Yasuhiro Konishi; Takahiro Komatsu, and Hiroyuki Yamasaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 269,757

Claims priority, application Japan, Dec. 24, 1987, 62-327940; Jan. 20, 1988, 63-11257; Feb. 3, 1988, 63-24284

Int. Cl.[5] G11C 7/00, 11/40

U.S. Cl. 365—207 13 Claims



1. A semiconductor memory device having a memory cell array of a plurality of memory cells arranged in rows and in columns, a plurality of word lines for selecting a row out of said memory cell array, and a plurality of pairs of bit lines for selecting a column out of said memory cell array, comprising:

row address input means for receiving an externally applied row address,

row selection means for selecting a row out of said memory cell array in response to the row address from said row address input means,

column address input means for receiving an externally applied column address,

column selection means for selecting a bit line pair for selecting a column out of said memory cell array in response to the column address from said column address input means,

a pair of write-in data transferring bus lines connected to a bit line pair designated by said column address in response to an output of said column selection means in writing operation, for transferring data to be written in a memory cell selected by said row address and said column address,

a pair of read-out transferring bus lines provided separately from said pair of write-in data transferring buses, for transferring data on the bit line pair selected by said column address in reading operation, and

amplifier means corresponding to each bit line pair and responsive to the output of said column selection means for driving said read-out data transferring bus lines in accordance with data on said selected bit line pair, said amplifier means comprising

(a) means for directly receiving and detecting a voltage difference of said selected bit line pair;

(b) first and second voltage amplification means for amplifying respectively, voltages on the bit lines of said selected bit line pair;

(c) means for establishing a positive feedback signal flow path between said first and second voltage amplification means, to increase a rate of voltage change of said first and second voltage amplification means;

(d) means responsive to said first and second voltage amplification means for controlling first and second currents;

(e) means for converting said first and second currents to a voltage difference;

(f) means for applying said voltage difference to said read-out data transferring bus lines;

flip-flop type sense amplifiers provided for the respective bit line pairs, for differentially amplifying a potential difference on the corresponding bit line pair, and

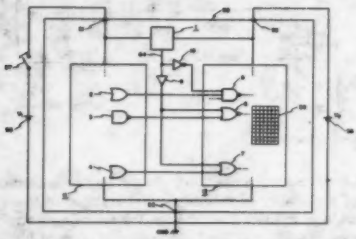
means for activating said amplifier means before the corresponding one of said flip-flop type sense amplifiers is activated.

4,954,993

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING A PLURALITY OF CIRCUIT BLOCKS RESPECTIVELY SUPPLIED WITH POWER FROM DIFFERENT POWER SOURCES

Masaya Yamaguchi, and Takamasa Sumki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jul. 1, 1988, Ser. No. 214,189
Claims priority, application Japan, Jul. 2, 1987, 62-166320
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—226 **6 Claims**



1. A semiconductor integrated circuit comprising:
a first power terminal for receiving a first power having a first voltage;
a second power terminal for receiving a second power having a second voltage;
a first circuit block energized exclusively by said first power, said first circuit block having a plurality of input gates;
a second circuit block energized exclusively by said second power, said second circuit block producing output signals which are supplied to said input gates of said first circuit block;
detection circuit means for detecting a deenergization of said second circuit block in order to produce a detection signal; and
means for controlling said input gates to produce predetermined output level signals in response to said detection signal, each of said input gates being logical gates for processing a binary logic signal, and each of said predetermined output level signals having one signal level of said binary logic signal, wherein said controlling means has a circuit for receiving said detection signal to produce first and second control signals, said first control signal having a non-inverted relationship with respect to said detection signal and said second control signal having an inverted relationship with respect to said detection signal, wherein each of said input gates receives a selected one of said first and second control signals together with one of said output signals from said second circuit block, said selected one of said first and second control signals causing a predetermined output level signal from said input gates.

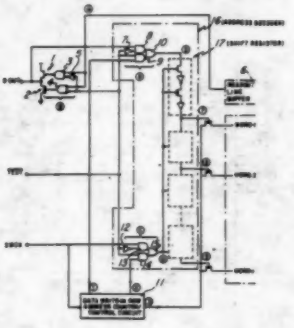
4,954,994

FIFO MEMORY CAPABLE OF SIMULTANEOUSLY SELECTING A PLURALITY OF WORD LINES

Masahi Hashimoto, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 16, 1988, Ser. No. 245,833
Claims priority, application Japan, Sep. 18, 1987, 62-234523
Int. Cl.[5] G11C *8/00*
U.S. Cl. 365—230.06 **5 Claims**

1. A semiconductor memory device comprising:
a plurality of word lines;
a readout line buffer;
an output buffer connected to said readout line buffer for receiving the output therefrom;
control circuit means including a data write-in row address counter and having a plurality of outputs, one of which is connected to each of said plurality of word lines;
at least one address decoder including
shift register having a plurality of successive shift register positions respectively connected to corresponding individual word lines,
first selector means connected between one of the outputs of said control circuit means and the initial shift register position of said shift register for receiving a first control signal from said control circuit means, and
second selector means connected between another output of said control circuit and each of the plurality of shift register positions arranged in parallel for receiving a second control signal from said control circuit means;



binary data as applied to said shift register being successively shifted through each of said plurality of shift register positions in response to said first control signal activating said first selector means to provide a series of output signals as binary data in one of two binary logic states for storage in the initial shift register position and in each of the remaining shift register positions;
one of the two binary logic states if stored in a respective shift register position designating the selection of the word line corresponding thereto, and the other of the two binary logic states if stored in a respective shift register position designating the non-selection of the word line corresponding thereto; and
each of shift pluality of word lines corresponding to a respective shift register position having said one binary logic state stored therein being selected so as to be conductive in response to said second control signal activating said second selector means to provide an output signal to each of said shift register positions simultaneously.

4,954,995

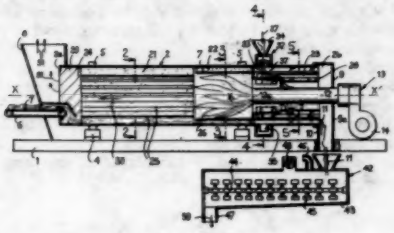
DEVICE AND METHOD FOR PREPARING BITUMINOUS PRODUCTS

Guy Marconnet, Rive de Gier, France, assignor to Ermont C. M., Lorette, France

Filed May 11, 1989, Ser. No. 350,437
Claims priority, application France, May 13, 1988, 88 06474
Int. Cl.[5] B28C *5/14, 5/20*; F27B *7/16, 7/34*
U.S. Cl. 366—7 **4 Claims**

4. Method for preparing bituminous coated products from virgin aggregates, recycled bituminous mixes and liquid bitumen, said method comprising the steps of
(a) drying and heating said virgin aggregates by circulating hot gases in a direction opposite to a direction of movement of said virgin aggregates;

(b) heating said recycled bituminous mix in granular form by bringing it into contact with said dried and heated virgin aggregates;
(c) mixing said virgin aggregates and recycled bituminous mix so as to pre-coat said virgin aggregates;



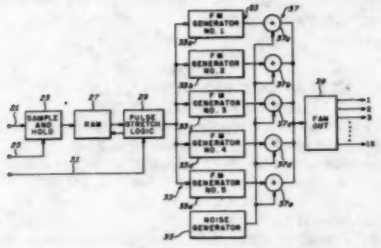
(d) introducing the mixture of recycled bituminous mix and hot pre-coated virgin aggregates into a mixer; and
(e) mixing said pre-coated virgin aggregates and recycled bituminous mix with liquid bitumen.

4,954,996

NAVIGATION SONAR SYSTEM DOCKSIDE SIMULATOR

Luciano Fazzolari, New Hyde Park; Frank P. Giattini, West Hempstead; Anthony L. Scoca, Hicksville, and Eugene C. Zavacki, Levittown, all of N.Y., assignors to Unisys Corporation, Blue Bell, Pa.

Filed May 15, 1989, Ser. No. 352,224
Int. Cl.[5] H04B *17/00*
U.S. Cl. 367—13 **6 Claims**



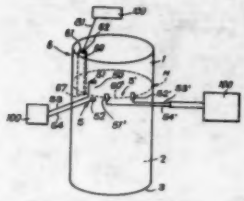
1. An apparatus for simulating sonar signals for a sonar navigation system on board a ship comprising:
means for providing pulses simulating returned transmitted sonar pulses stretched in accordance with water bottom scattering;
means coupled to said sonar pulses means for providing phase shifts to said sonar pulses that are respectively representative of a predetermined velocity of said ship, thereby providing pulses phase shifted sonar signals; and
means for coupling said pulsed phase shifted sonar signals to processing channels of said sonar navigation system.

4,954,997

SENSOR DEVICE USING LAMB ELASTIC WAVES FOR DETECTING THE PRESENCE OF A LIQUID AT A PREDETERMINED LEVEL

Eugène J. Dieulesaint, Saint-Maur; Daniel R. Royer, Sainte-Genevieve des Bois, and Olivier R. Legras, Meaux, all of France, assignors to Materiel et Auxiliare de Signalisation et de Controle Pour L'Automation, Courbevoie, France

Filed Mar. 3, 1989, Ser. No. 318,603
Claims priority, application France, Mar. 8, 1988, 88 02962
Int. Cl.[5] G08B *21/00*
U.S. Cl. 367—13 **9 Claims**



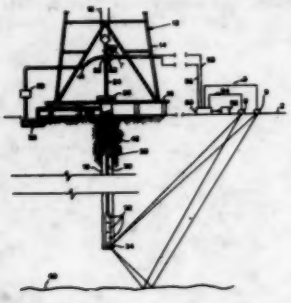
1. A sensor using Lamb elastic waves for detecting the presence or absence of a liquid at a predetermined level N in a tank defined by a wall have a thickness e, comprising:
(a) transmitter transducer means located on an external face of a portion of the wall defining the tank, which wall portion comprises a detection plate having an internal face that may come into contact with the liquid, said transmitter transducer means for locally generating Lamb waves in said wall portion;
(b) receiver transducer means located on said external face of said wall portion of the tank proximate the predetermined level N, said receiver transducer means for detecting the presence or absence of Lamb waves transmitted along said wall portion;
(c) electronic signal processing means for processing signals applied to said transmitter transducer means and received by said receiver transducer means, said electronic signal processing means including a high gain amplifier, an input of which is connected to said receiver transducer means, and an output of which is connected to said transmitter transducer means to, thereby, form a closed loop, a filter for allowing said closed loop to oscillate only at an excitation frequency of said transmitter transducer means, and means for detecting the presence of oscillations at said excitation frequency f when liquid in the tank remains below the predetermined level N;
(d) means for adjusting said electronic signal processing means to excite said transmitter transducer means to generate first symmetrical mode So of Lamb waves in said wall portion and to excite that mode only; and
(e) a prism-shaped member mounting each of said transmitter transducer means and said receiver transducer means, said prism-shaped members being attached to said wall portion to dispose said transmitter transmitter means and said receiver transducer means at an angle θ to said external face of said wall portion such that $\sin \theta = v_{prism}/v_{plate}$, wherein v prism and v plate represent the phase velocities, respectively, of longitudinal waves created in said prism-shaped members and Lamb waves created in said wall portion;
(f) wherein said excitation frequency of said transmitter transducer means is determined as a function of the thickness e of said wall portion in such a manner so that the group velocity of said first symmetrical mode So of the Lamb waves is minimized.

4,954,998

METHOD FOR REDUCING NOISE IN DRILL STRING SIGNALS

James W. Rector, Menlo Park, Calif., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jan. 23, 1989, Ser. No. 300,315
Int. Cl.[5] G01V 1/40
U.S. Cl. 367—82 31 Claims



17. A method of determining the location of subsurface interfaces in the region of the earth around a wellbore comprising:

generating energy having a detectable pattern at the lower end of a drill string utilized for drilling said wellbore;

detecting with a sensor at the upper end of said drill string adapted to sense vertical motion the energy generated at the lower end of said drill string to generate a pilot signal;

detecting horizontal motion at the upper end of said drill string to generate a noise signal;

detecting seismic energy emanating from said source at least one location at the earth's surface displaced from said wellbore to generate a field signal;

determining a frequency band within said pilot signal and said noise signal in which there is high coherence in the amplitude of noise energy;

weighting said noise signal within at least said frequency band in proportion to the average ratio within said frequency band of the noise energy in said pilot signal to the noise energy within said noise signal to generate a weighted noise signal;

subtracting the weighted noise signal within at least said frequency band from said pilot signal to generate a noise reduced pilot signal; and

correlating said noise reduced pilot signal with said field signal to determine the location of subsurface interfaces.

4,954,999

DOUBLE PHASE-LOCK-LOOP SONAR

Willis A. Teel, and James T. Christoff, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1975, Ser. No. 609,453
Int. Cl.[5] G01S 15/00
U.S. Cl. 367—97 18 Claims

1. An echo-ranging-search system adapted for being mounted on a carrier vehicle that is capable of moving in a predetermined environmental medium, comprising in combination:

means for broadcasting a predetermined target search signal within the aforesaid predetermined environmental medium;

receiving and converting means effectively synchronized with said broadcasting means for receiving the aforesaid predetermined target search signal after it has been reflected as an echo signal from a target located within said predetermined environmental medium and for converting it into a first electrical signal that is proportional thereto;

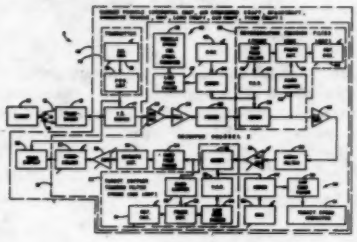
first mixing means connected to the output of said receiving and converting means for mixing said first electrical signal with a second electrical signal supplied thereto, so as to produce a third electrical signal at the output thereof;

notch filter means effectively connected to the output of said first mixing means for filtering said third electrical signal in such manner as to pass a predetermined band of frequencies therethrough;

second mixing means having a pair of inputs and an output, with one of the inputs thereof effectively connected to the output of said notch filter means;

a narrow band pass filter means connected to the output of said second mixing means;

detector means connected to the output of said narrow bandpass filter means;



means effectively connected to the output of said detector means for reading out a predetermined level of the output signal therefrom in terms of the targets from which the aforesaid echo signal is reflected;

means connected to the output and the other input of said first mixing means for adjusting the frequency of said second electrical signal supplied to the other input thereof in such manner as to compensate for reverberations received from within the aforesaid environmental medium within said echo signals;

and means connected between the output and the other input of said second mixing means for adjusting the output signal therefrom in such manner as to compensate for any doppler effects that occur therein due to any relative movement between the aforesaid receiving and converting means and said target.

4,955,000

ULTRASONIC PERSONNEL LOCATION IDENTIFICATION SYSTEM

Harvey J. Nastrom, Shoreview, Minn., assignor to NAC Engineering and Marketing, Inc., Shoreview, Minn.

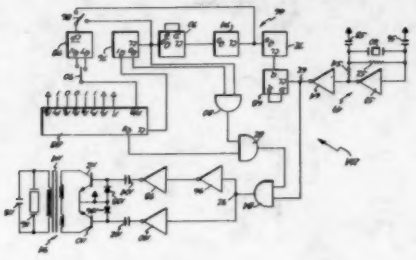
Continuation of Ser. No. 887,071, Jul. 17, 1986, abandoned. This application Jun. 16, 1989, Ser. No. 368,054
Int. Cl.[5] G01S 15/88
U.S. Cl. 367—117 15 Claims

1. An ultrasonic system for identifying the location of personnel within a multiple room complex including:

at least one ultrasonic transmitter adapted to be transported by a person, for periodically transmitting ultrasonic transmitter signals formed by pulse code modulated (PCM) portions representative of a digital code sequence characteristic of a person and separated from one another by transmitter signal periods, the PCM portions formed by a predetermined number of bit positions representative of a digital value and separated from one another by predetermined bit spacing periods;

a plurality of ultrasonic receivers, each adapted to be positioned in a room of the complex, for receiving the transmitter signals and providing receiver signals as a function thereof, each ultrasonic receiver including a timer for

timing detector window periods separated from one another by window spacing periods corresponding to the bit spacing periods of the PCM portions of the transmitter signals, and a detector for determining the code sequence



of the received transmitter signal by detecting digital values only during the timed window periods; and

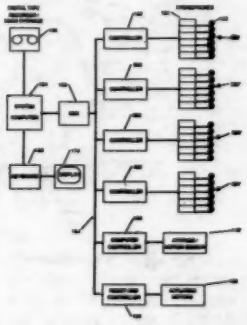
a central station coupled to the receivers to receive the receiver signals, for providing an indication of the room in which the person transporting the receiver is located.

4,955,001

AREAL SOUND INTENSITY RECEIVER

Jacques Y. Guigné, St. John's, Canada, assignor to Nordco Limited, St. John's, Canada

Filed Feb. 20, 1990, Ser. No. 481,433
Int. Cl.[5] G01S *3/80*; G01H *3/12*
U.S. Cl. 367—118 **9 Claims**



1. A device for measuring the intensity of sound from an acoustic source in a medium comprising:

(a) at least three microphone arrays spaced from each other, each of said microphone arrays comprising six microphones configured as three orthogonal pairs of microphones;

(b) means for simultaneously sensing the output from each of said microphones in order to determine a real-time sound intensity vector at each of said microphone arrays; and

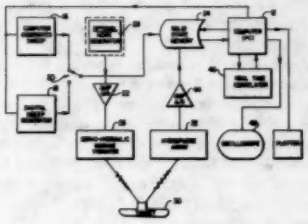
(c) means for providing an indication of the areal intensity of sound through a notional plane bounded by at least three of said at least three microphone arrays.

4,955,002

VIBRATORY, TIME VARIANT, PSEUDORANDOM SONAR SYSTEM

Donald R. Campbell, Houston, Tex., assignor to Camex, Houston, Tex.

Filed Jul. 31, 1989, Ser. No. 387,713
Int. Cl.[5] G01J *15/00*
U.S. Cl. 367—99 **12 Claims**



1. A vibratory, time variant, pseudorandom sonar system comprising:

first means for converting an electrical signal into a corresponding acoustic signal for injection into a fluid body for reflection by a target;

second means including a plurality of detectors selectively spaced for detecting incoming acoustic waves;

third means for correlating the electrical signals corresponding to the acoustic wave of the first means and the incoming acoustic waves of the second means and generating a signature pulse indicative of the target;

fourth means for storing the electrical signals and signature pulse generated by the first through the third means;

fifth means for determining the lapsed times between the injection of the acoustic wave by the first means, and detection of the reflected acoustic wave by the plurality of detectors of the second means;

sixth means for communicating information to the user; and

seventh means connected to the: first, fourth, and fifth means, respectively, for activating the first means for injecting the acoustic wave into the fluid body, storing the acoustic wave, and starting the fifth means; second, fourth and fifth means, respectively, for receiving the incoming acoustic waves, storing the incoming acoustic waves detected by the plurality of detectors of the second means, and stopping the fifth means for determining and storing the elapsed times between injection of the acoustic wave and detections of the reflected acoustic waves; fourth and third means, respectively, for fetching the injected acoustic wave and reflected acoustic waves for correlation and generating target signature signals; fourth means for fetching the elapsed time signals for producing bearing and range information; and sixth means for communicating the signature signal together with the bearing and range information.

4,955,003

PHASE ACCUMULATOR-BEARING TRACKER

Warren A. Goldman, Fitchville, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1984, Ser. No. 617,282
Int. Cl.[5] G01S *3/80*
U.S. Cl. 367—125 **4 Claims**

1. A tracking apparatus for passively determining the bearing of a remote source, comprising:

a first transducer means, for receiving an impinging acoustic signal from said remote source and converting said acoustic signal into a first proportional electrical signal;

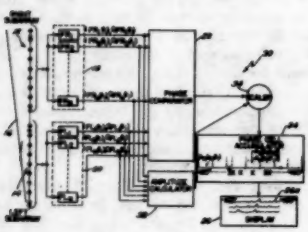
a second transducer means, spatially displaced from said first

transducer means, for receiving said impinging acoustic signal from said remote source and converting said acoustic signal into a second proportional electrical signal;

a first plurality of sequential bandpass filter means, attached to said first transducer means, for receiving said first electrical signal and producing a corresponding first plurality of in-phase and quadrature components for each said first plurality of filter means therefrom, each said first filter means being selected to cover a contiguous portion of the frequency band of interest such that collectively said first plurality of filter means encompass the frequency band of interest;

a second plurality of sequential bandpass filter means, attached to said second transducer means, for receiving said second electrical signal and producing a corresponding second plurality of in-phase and quadrature components for each said second plurality of filter means therefrom, each said second filter means being selected to cover a contiguous portion of the frequency band of interest such that collectively said second plurality of filter means encompass the frequency band of interest;

phase comparator means, connected to said first and said second plurality of bandpass filter means, for receiving said first and said second plurality of in-phase and quadrature components therefrom and determining a corresponding plurality of respective electrical phase differences, b_1–b_N, one difference for each pair of corresponding first and second filter means covering an identical portion of said frequency band;



accumulator means, attached to said phase comparator means, for receiving said plurality of phase differences, b_1–b_N, for a present plurality of time intervals t_i, said accumulator means further comprising a preselected plurality of phase cells chosen to correspond to degrees of bearing, wherein said plurality of phase differences are selectively distributed;

display means, connected to said accumulator means, for receiving the accumulated phase difference outputs $b_1(ti)$-$(b_N(ti)$ of said phase cells for each t_i and producing a plurality of proportional bearing vs. time traces, one trace for each preselected range, i, of accumulation time t_i;

an amplitude calculating means, connected to each of said first and second pluralities of bandpass filter means, for receiving said first and second pluralities of in-phase and quadrature components therefrom and calculating a corresponding plurality of amplitudes, A_1-A_N, therewith; and

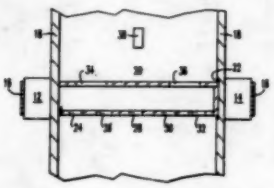
scaler means, connected to said phase comparator means, said amplitude calculating means and said accumulator means, for receiving said plurality of electrical phase differences, b_1-b_N, from said phase comparator means and weighing each said phase difference with the corresponding amplitude, A_1-A_N, before depositing the resulting plurality of products, A_1b_1-A_Nb_N, into said accumulator means.

4,955,004

LIQUID ACOUSTIC WAVEGUIDE TUBE

Paul W. Viscovich, Longwood, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 6, 1988, Ser. No. 240,779
Int. Cl.[5] G01S 15/00
U.S. Cl. 367—137 20 Claims



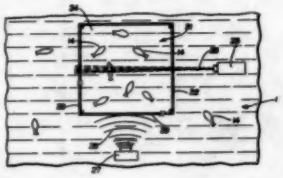
1. A monitor for detecting the presence of a liquid phase in a multi-phase fluid conduit wherein said fluid has at least a liquid phase, and wherein a second phase may be present in said fluid, comprising, an ultrasonic signal transmitter for generating and transmitting an ultrasonic signal, an ultrasonic signal receiver, attachment means for attaching said transmitter and receiver to said conduit, and waveguide means for confining a portion of said fluid so that said ultrasonic signal is guided to said receiver when either said liquid phase or said second phase is present in said confined portion.

4,955,005

UNDERWATER ACOUSTIC ANIMAL GUIDANCE SYSTEM

Paul H. Loeffelman, 1270 Clubview Blvd. N., Worthington, Ohio 43235

Filed Oct. 5, 1988, Ser. No. 253,985
Int. Cl.[5] H04B 1/02
U.S. Cl. 367—139 28 Claims



1. A system for guiding aquatic animals to or from an underwater area with underwater acoustic stimuli including:

(a) acoustic recording chamber means for measuring and recording sounds of aquatic animals of the type possibly present in said underwater area contained in said chamber means;

(b) means for electrically developing a new artificial sound using information from the animal sounds recorded in the recording chamber means;

(c) behavior chamber means adapted to be located in said underwater area for observing responses in said aquatic animals contained in the behavior chamber means when the new artificial sound is applied thereto; and

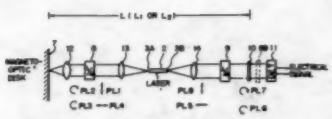
(d) means for adjusting the new artificial sound for increasing its guiding effectiveness on the aquatic animals upon observing the effect of the artificial sound being applied to the animals in the behavior chamber means.

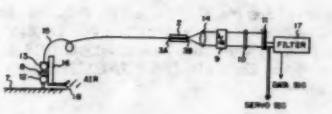
4,955,006

FLOATING TYPE MAGNETO-OPTIC DISK READING HEAD SYSTEM HAVING EXTERNAL SEMICONDUCTOR LASER RESONATOR OPERATING AT ORTHOGONAL TWO MODE OSCILLATIONS

Nobuhiro Fukushima, Kawasaki, and Ippei Sawaki, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 11, 1989, Ser. No. 295,753
Claims priority, application Japan, Jan. 13, 1988, 63-005427; Aug. 30, 1988, 63-216718
Int. Cl.[5] G11B 11/12, 13/04
U.S. Cl. 369—13 14 Claims





1. A magneto-optic disk reading head system for reading data magneto-optically stored in a magneto-optic disk, comprising an orthogonal two mode oscillation type resonator formed by a predetermined effective cavity length and outputting a beat signal indicating said stored data,

said resonator comprising

a laser means including a semiconductor laser for emitting orthogonal two mode lights from one end thereof,

a first polarization means provided to receive said incident lights, for polarizing said incident lights,

said magneto-optic disk provided to receive said lights polarized by said first polarization means, for changing angles of said polarized lights in response to said data and for reflecting said angle changed polarized lights to said first polarization means to be further polarized thereat, said laser means passing said further polarized lights to another end of said laser means,

a second polarization means provided to receive said lights passed through said laser means, for polarizing said passed lights, and

a semi-transparent mirror means provided to receive said lights polarized at said second polarization means, for reflecting a part of said lights polarized at said second polarized means, said part of said lights includes said incident lights to said second polarization means to be further polarized thereat, and passing a beat light,

said incident lights further polarized at said second polarization means being directed to and passing through said laser means,

a distance between said magneto-optic disk and said semi-transparent mirror means defining said effective cavity length,

said resonator substantially resonating said orthogonal two mode lights therein,

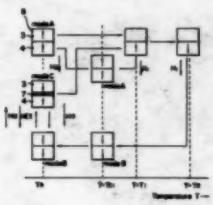
said beat light output from said semitransparent mirror means having a frequency defined by said effective cavity length and said angles changed at said magneto-optic disk.

4,955,007

THERMOMAGNETIC RECORDING METHOD APPLYING POWER MODULATED LASER ON A MAGNETICALLY COUPLED DOUBLE LAYER STRUCTURE OF PERPENDICULAR ANISOTROPY FILM

Katsuhisa Aratani, Chiba, and Tomiji Tanaka, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,440
Claims priority, application Japan, Aug. 20, 1986, 61-294961; Aug. 20, 1986, 61-194962; Aug. 22, 1986, 61-195616
Int. Cl.[5] G11B 11/14, 13/04
U.S. Cl. 369—13 5 Claims



1. A thermomagnetic recording method comprising the steps of;

(a) providing a thermomagnetic recording medium having a magnetic recording layer formed of first and second magnetic thin films magnetically coupled with each other, said second magnetic thin film having an initial magnetic moment in a first direction,

(b) heating said magnetic recording layer to a first temperature T_1 which is higher than a Curie temperature T_{c1} of said first magnetic thin film and does not cause the inversion of said initial magnetic moment of said second magnetic thin film,

(c) cooling said magnetic recording layer from said first temperature while applying an external magnetic field in a direction opposite to the direction of magnetization of said second magnetic thin film to derive, a magnetic moment in said first magnetic thin film which is in same direction as said initial magnetic moment in said second magnetic thin film,

(d) heating said magnetic recording layer to a second temperature T_2 which is higher than said Curie temperature T_{c1} and enough to cause the inversion of said initial magnetic moment in said second magnetic thin film,

(e) cooling said magnetic recording layer from said second temperature T_2 while applying said external magnetic field to derive, a magnetic moment in said first magnetic thin film which is opposite in direction from said initial magnetic moment following the inversion of the magnetic moment in said second magnetic thin film, wherein said first and second heating states are modulated according to a signal to be recorded.

4,955,008

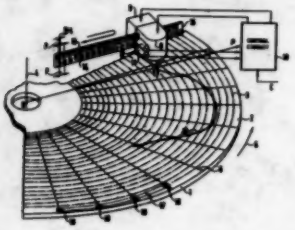
PREWRITTEN DATA STORAGE MEDIUM AND OPTICAL SCANNING DEVICE THEREFOR

Michel Collomby, Saubens; Daniel Bec, Villeneuve Toloosne, and Jean-Louis Gerard, Ramonville St Agne, all of France, assignors to Alcatel Thomson Gigadisc, Paris, France

Division of Ser. No. 935,222, Nov. 26, 1986, Pat. No. 4,809,251.
This application Nov. 22, 1988, Ser. No. 275,111
Claims priority, application France, Nov. 27, 1985, 85 17560
Int. Cl.[5] G11B 17/22
U.S. Cl. 369—32 4 Claims

1. A method of sampling mode access to a track in a data storage medium in the form of a disk comprising a reference surface, a set of adjacent track elements on said reference

surface, respective curved axes of said adjacent track element, prewritten patterns on said axes, areas reserved for storing data on said axes alternating with said prewritten patterns, a common rotation center of said curved axes, a first set of N radii issuing from said common rotation center on which said patterns lie, equi-angularly separated and each defining with said axes sites of intersection, synchronization patterns occupying said sites of intersection, at least one other set of radii P, issuing from said common rotation center with a predetermined circumferential offset relative to said N radii, said P radii being provided with a graduation scale including a radial arrangement of specific patterns, said method comprising the steps of:



scanning, with a focussed reading light spot, of said reference surface in a direction transverse to said tracks;

determination of an amplitude and of a sign of radial displacement of said spot within said set of adjacent track elements when said spot interacts optically and repeatedly with said graduation scale, and

determination of an instantaneous position of said spot relative to said graduation scale when said spot scans said radial arrangement, said determinations being used to calculate the position of the spot in order to access a track.

4,955,009

OPTICAL DISK DRIVE APPARATUS HAVING COUNTER DISABLE AT SEEK START-UP

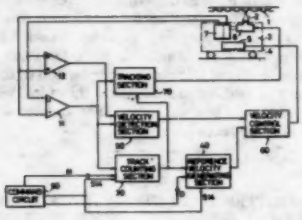
Keiji Nakatsu, and Masaharu Ogawa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,985

Claims priority, application Japan, Apr. 30, 1987, 62-109330

Int. Cl.[5] G11B *19/02*

U.S. Cl. 369—32 **12 Claims**



1. An optical disk drive apparatus for driving an optical disk having tracks for recording information, comprising:

an optical head for focusing a light beam onto a spot on a track on the optical disk;

an actuator for moving the optical head, thereby causing the spot of the light beam to move from its current track to a target track in order to access the target track;

command means providing information on the number of tracks to be moved for the access to a target track;

means for counting the tracks moved by the spot of the light beam; and

means for disabling the counting of tracks for an interval at the start of each track access operation to make false indicators of a track count that may occur at said start of each track access operation.

4,955,010

CONSTANT VELOCITY TRACK JUMP SERVO SYSTEM FOR DISC PLAYERS

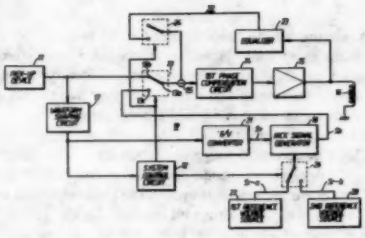
Daiki Nabeshima, and Hiroshi Nakane, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 885,711, Jul. 15, 1986, abandoned. This application Aug. 3, 1988, Ser. No. 228,844

Claims priority, application Japan, Jul. 18, 1985, 60-159125

Int. Cl.[5] G11B *21/08, 7/085, 21/10*

U.S. Cl. 369—32 **17 Claims**



1. A record disc reproducing apparatus comprising:

a pick-up device for reading data from a disc;

means for moving said pick-up device radially across said disc, said moving means including a first phase compensation circuit with a first phase compensation characteristic for stabilizing the pick-up device in a reproducing mode;

means for producing a velocity signal corresponding to a moving velocity of said pick-up device;

kick signal generating means for comparing said velocity signal to a reference velocity signal and generating a kick signal used to control said moving means so as to cause said velocity signal to approach a value of said reference velocity signal;

a second phase compensation circuit having a second characteristic different from said first characteristic, said second phase compensation circuit being responsive to said kick signal and having an output which is connected to an input of said first phase compensation circuit in a search mode, so as to eliminate an effect of the phase compensation of said first phase compensation circuit when the pick-up device is in said search mode; and

control means for selectively applying said kick signal to said moving means during said search mode to cause said pick-up device to move at a velocity corresponding to said reference velocity signal.

4,955,011

INFORMATION RECORDING/REPRODUCING APPARATUS WITH CONTROL DEVICE FOR MAINTAINING HEAD VELOCITY BELOW A CRITICAL VELOCITY

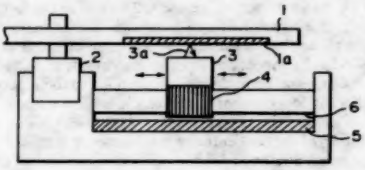
Hisatoshi Baba, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 35,771, Apr. 8, 1987, abandoned. This application May 23, 1989, Ser. No. 356,662

Claims priority, application Japan, Apr. 10, 1986, 61-81103; Jun. 16, 1986, 61-138345

Int. Cl.[5] G11B 7/085

U.S. Cl. 369—54 **11 Claims**



1. An information recording and/or reproducing apparatus, comprising:

a head for performing at least one of information recording for recording information on an information recording medium and information reproducing for reproducing recorded information from the recorded medium;

moving means for moving said head relative to the recording medium, said moving means comprising means for applying a force including a braking force to said head;

velocity detecting means for detecting velocity of said head; and

control means comprising means for comparing the moving velocity detected by said velocity detecting means with a predetermined critical velocity for said head for controlling said moving means to apply the braking force to said head by said moving means for stopping said head when the moving velocity detected by said velocity detecting means exceeds the predetermined critical velocity.

4,955,012

SEISMIC STREAMER CABLE

Steven W. Bledsoe, and Alan D. McMurry, both of Friendswood, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 121,271, Nov. 16, 1987, Pat. No. 4,809,243, which is a continuation of Ser. No. 915,060, Oct. 3, 1986, abandoned. This application Dec. 9, 1988, Ser. No. 281,858

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] G01V 1/38

U.S. Cl. 367—154 **14 Claims**

1. A streamer-cable assembly, comprising:

(a) a streamer cable jacket having a first and a second end;

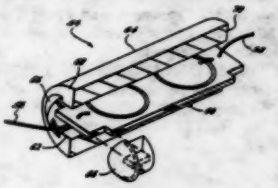
(b) first and second means disposed within said cable jacket for providing buoyancy to the streamer-cable assembly;

(c) first and second means disposed within the jacket for damping internally-propagating tube waves, the second means comprising a resilient tubular capsule axially disposed within the first means;

(d) means disposed within the jacket and adjacent the damping means for reducing lateral movement of the streamer-cable;

(e) a first and a second connector sealing the first and second end of the cable jacket and each connected to the means for reducing lateral movement of the streamer cable;

(f) means for detecting transient pressure pulses disposed within the damping means at predetermined intervals; and



(g) means extending through the damping means and interconnecting the first and second connector for operably coupling the detecting means to a recording and control unit.

4,955,013

OPERATING A MULTIPLE-ACCESS OPTICAL NETWORK

Peter Healey, Ipswich, England, assignor to British Telecommunications plc, London, England

PCT No. PCT/GB86/00741, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03761, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 5, 1986, Ser. No. 95,173

Claims priority, application United Kingdom, Dec. 6, 1985, 8530087

Int. Cl.[5] H04B 9/00

U.S. Cl. 370—1 **13 Claims**

$$\begin{bmatrix} P_1 \\ P_3 \\ P_5 \end{bmatrix} = \frac{1}{(N-1)} \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix} \cdot \begin{bmatrix} P_2 \\ P_4 \\ P_6 \end{bmatrix}$$

1. A method of operating a multiple-access optical network having at least three communication stations, the stations being physically coupled together by optical waveguides arranged such that each station can transmit signals to plural of the other stations over information transfer channels based on a multiple-access technique but cannot receive signals it has itself transmitted, the method comprising:

causing one station to transmit information using a selected information transfer channel to a receiving station; and

causing the receiving station to transmit simultaneously a signal using the same information transfer channel whereby other stations also receiving on the same information transfer channel receive a confusing mixture of transmissions from said one station and from said receiving station.

4,955,014

BROADBAND OPTICAL COMMUNICATION SYSTEM, PARTICULARLY IN THE SUBSCRIBER AREA

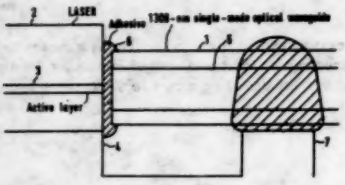
Dieter Kuppers, Stuttgart; Klaus Herse, Weil der Stadt; Kate Hiepe-Wohlleben, Leonberg; Manfred Kaiser, Hemmingen; Friedemann Mohr, Renningen, and Horst Ohnsorge, Freiberg/N., all of Fed. Rep. of Germany, assignors to Alcatel N. V., Amsterdam, Netherlands

Filed Oct. 30, 1987, Ser. No. 115,254

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637097; Mar. 24, 1987, 3709678

Int. Cl.[5] H04J *14/04, 16/24*

U.S. Cl. 370—3 11 Claims



1. A broadband optical communication system comprising an optical waveguide having an associated cutoff wavelength below which a fundamental mode and at least one higher order mode can propagate throughout the waveguide,

a first semiconductor laser having a light emitting surface at a first end of said waveguide for transmitting a first optical signal in a fundamental mode at a first operating wavelength which is clearly below said predetermined cutoff wavelength,

a first semiconductor photodiode at a second end of said waveguide for receiving said fundamental mode of said first optical signal at said first operating wavelength, and

means for positioning said first semiconductor laser relative to said first end of the optical waveguide such that only said fundamental mode is excited in any portion of the waveguide in response to said first semiconductor laser transmitting said first optical signal.

4,955,015

SELF-CONTROLLED CONCENTRATOR OPERATING PACKET-SYNCHRONIZED FOR FAST DATA PACKET SWITCHING NETWORKS

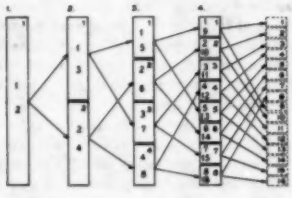
Manfred Lobjinski; Michael Horn, and Andreas Reppekus, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,295

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732824

Int. Cl.[5] H04L *12/56*

U.S. Cl. 370—56 6 Claims



1. A self-controlled concentrator operating packet-synchronized for fast data packet switching networks, wherein the first bits of each of the totality of data packets acts on the totality of the switch elements of the concentrator in accordance with the switch positions of such switch elements, characterized in that

the switch elements are beta elements (β) having two inputs and two outputs, whereby a plurality of stages each having n/2 beta elements (β) are provided, whereby n is the number of inputs and n is the number of outputs of the concentrator;

a connecting structure connected between adjacent stages, said connecting structure constituting a perfect shuffle;

the stages are subdivided into blocks such that the plurality of blocks increases according to a power of 2 ascending from stage to stage, whereby the number of blocks in the first stage is 2^0, the number of blocks in the second stage is 2^1, etc., whereby there are n/2 blocks in the last stage, to form a binary tree structure; and

at least one beta element (β) in each block selectively switching connections from its two inputs to its two outputs, in response to the signals supplied to the inputs of an adjacent beta element in said block, whereby a concentration of the bits having a prescribed binary value at the outputs of the concentrator is produced at the last stage of the concentrator to produce the concentration of the said data packets.

4,955,016

INTERCONNECT FABRIC PROVIDING CONNECTIVITY BETWEEN AN INPUT AND ARBITRARY OUTPUT(S) OF A GROUP OF OUTLETS

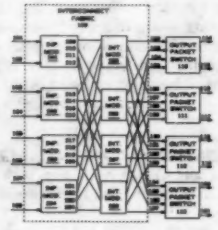
Kai Y. Eng, Eatontown; Mark J. Karol, Fair Haven, and Yu S. Yeh, Freehold, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 29, 1989, Ser. No. 400,184

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.[5] H04Q *11/04*

U.S. Cl. 370—60 7 Claims



5. In an interconnect fabric comprising a plurality of interconnect fabric input ports, each input port being arranged for receiving data packets concurrent with data packets being received at others of the plurality of interconnect fabric input ports, and a plurality of groups of output ports, each group comprising a separate number of output ports, where the separate number of output ports comprised in a group of output ports may be the same as or different from the number of output ports comprised in other groups of output ports, at least one group of output ports comprising a plurality of output ports, a method of conveying each packet received at an interconnect fabric input port to an available interconnect fabric output port of a group of output ports for which the packet is destined, comprising the steps of:

(a) mapping each received data packet to a destined group of output ports;

(b) establishing a separate communications path from each separate input port at which a data packet is received to a separate available output port of the destined group of output ports to which the data packet is mapped;

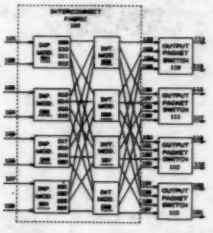
(c) transmitting each data packet over the separate established communications path; and
(d) discarding, or storing until a later time slot, packets received during a given time slot in excess of the separate number of output ports comprised in a group of output ports to which the excess packets are mapped.

4,955,017

GROWABLE PACKET SWITCH ARCHITECTURE

Kai Y. Eng, Eatontown; Mark J. Karol, Fair Haven, and Yu S. Yeh, Freehold, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 29, 1989, Ser. No. 400,183
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—60 **3 Claims**



1. A packet switching arrangement comprising:
(i) an interconnect fabric comprising:
a plurality of input ports for receiving data packets,
a plurality of groups of outport ports, each group of output ports comprising a separate number of output ports, where the separate number of output ports comprised in a group of output ports may be the same as or different from the number of output ports comprised in other groups of output ports, at least one group of output ports comprising a plurality of output ports,
means for mapping each received data packet to a group of output ports;
means for discarding, or storing until a subsequent time slot, those packets received during a given time slot and in excess of the number of output ports comprised in a group of output ports to which those packets are mapped; and
(ii) a plurality of output packet switches, each output packet switch being arranged to receive data packets from a separate group of interconnect fabric output ports and route the data packets to one or more destinations.

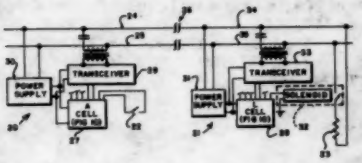
4,955,018

PROTOCOL FOR NETWORK HAVING PLURALITY OF INTELLIGENT CELLS

William B. Twitty, Santa Cruz, and Wendell B. Sander, Los Gatos, both of Calif., assignors to Echelon Systems Corporation, Palo Alto, Calif.

Division of Ser. No. 119,382, Nov. 10, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,942
Int. Cl.[5] H04J *3/26*
U.S. Cl. 370—85.1 **8 Claims**

1. In a network for sensing, communicating and controlling where said network includes at least a first and a second media, an improvement comprising:
a first plurality of cells coupled to said first media;
a second plurality of cells coupled to said second media;
a third cell coupled to both said first and second media;
at last one of said first cells and one of said second cells having a common group identification number and being assigned a group function for said group, said group function being a common task for sensing, communicating and controlling carried out by said cells in said group identified by said common group identification number;
said third cell having said common group identification



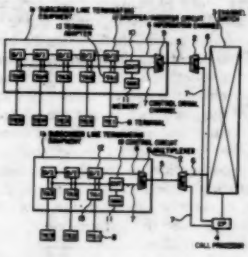
number for repeating messages broadcast between said cells having said common group identification number;
whereby sensing and control over a network having a plurality of media is achieved.

4,955,019

MULTIMEDIA INFORMATION EXCHANGING SYSTEM AND EQUIPMENT THEREFOR

Noboru Mizuhara, Kawasaki; Hoshi Tohru, Yokohama, and Takashi Morita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 150,170, Jan. 29, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 427,957
Claims priority, application Japan, Mar. 2, 1987, 62-63994
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—85.7 **21 Claims**

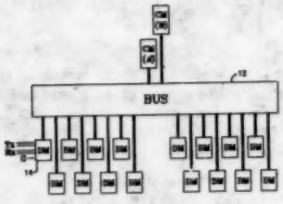


1. A method of exchanging information in a digital network having a plurality of subscriber lines, a plurality of subscriber line terminating equipments connected to said subscriber lines at the subscriber side to accommodate a plurality of terminal devices, respectively, and an exchange system to which said subscriber lines are connected, for selectively establishing a channel between two of said subscriber line terminating equipments, said channel being divided into a plurality of subchannels for parallel communication among a plurality of pairs of terminal devices accommodated in two of said subscriber line terminating equipments, comprising the steps of:
sending a call setup information from a first one of said subscriber line terminating equipments to the other one according to a request from a first terminal device accommodated in said first one of said subscriber line terminating equipments, said call setup information indicating at least one of the subchannels available for use in said channel established between two of said subscriber line terminating equipments; and
connecting said subchannel indicated by said call setup information to said first terminal device and a second terminal device accommodated in the other one of two of said subscriber line terminating equipments by means of the control operation of two of said subscriber line terminating equipments during the period which said first or second terminal device require.

4,955,020
BUS ARCHITECTURE FOR DIGITAL COMMUNICATIONS

William H. Stone, Somerdale, and William E. Boyer, Marlton, both of N.J., assignors to Infotron Systems Corporation, Cherry Hill, N.J.

Filed Jun. 29, 1989, Ser. No. 374,086
Int. Cl.[5] H04L 7/08, 12/40, 29.04
U.S. Cl. 370—85.9 31 Claims

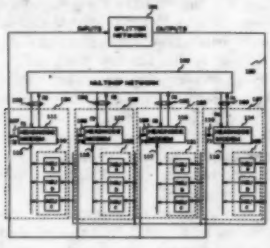


1. A digital communications apparatus comprising at least three modules and interconnecting means for providing communication paths between the modules, wherein the interconnecting means comprises a separate data bus for each of said modules, the data bus for each module being connected to conduct only data transmitted by its own module and to deliver the data so transmitted to every other one of said modules, in which said modules are arranged in an array with a first module at one end of the array, a last module at an opposite end of the array, and a plurality of intermediate modules situated between the first and last modules, and in which the data bus for each of the intermediate modules comprises a first section connected directly to the intermediate module by a first connection to conduct data transmitted by the intermediate module and to deliver the data so transmitted to the first module and to all of the modules between the intermediate module and the first module, and a second section connected directly to the intermediate module, by a second connection independent of the first connection, to conduct data transmitted by the same intermediate module and to deliver the data so transmitted to the last module and to all of the modules between the intermediate module and the last module.

4,955,021
EFFICIENT CONNECTION ARRANGEMENTS FOR MULTIHOP NETWORKS

Lee-Fang Wei, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 3, 1989, Ser. No. 374,895
Int. Cl.[5] H04J 1/00
U.S. Cl. 370—124 11 Claims

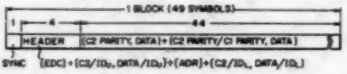


1. A communications network comprising (i) at least one communications media, and (ii) a plurality of NIUs, each NIU being arranged to receive data from at least one of the communications media on a first separate set of one or more frequencies and to transmit data onto at least one of the communications media on a second separate set of one or more frequencies and to add frequencies to, or subtract frequencies from, the first set of frequencies, and wherein data, transmitted from an NIU on a transmitting frequency which is not included in the first set of frequencies of an NIU to which the data is destined, is transmitted through one or more intermediate NIUs until reaching an intermediate NIU which transmits the data on a frequency which is included in the first set of frequencies of the NIU to which the data is destined.

4,955,022
ENCODING APPARATUS AND METHOD FOR ERROR CORRECTION

Kentaro Odaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 252,807
Claims priority, application Japan, Oct. 6, 1987, 62-251908
Int. Cl.[5] G06F 11/10
U.S. Cl. 371—37.4 20 Claims



11. A data encoding method for error correction of the type in which encoding is performed such that information symbols are respectively included in different first and second error correction code series, and one block of data is formed by header data, including at least a block address for discrimination of a data block, and a main data portion which does not include said address, said encoding method comprising the steps of:

(A) forming said first error correction code series (C1) including first parity data for a set of symbols in which a plurality of said blocks are arranged with respect to all of the symbols included in said blocks;

(B) mixing a part of said main data into said header data; and

(C) forming said second error correction code series (C2) including second parity data with regard to a part of the header data in Step (B) and all of said main data portion.

4,955,023
ERROR CORRECTION CONTROL SYSTEM FOR CONTROL MEMORY

Kenzo Tanimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,021
Claims priority, application Japan, Mar. 4, 1987, 62-47707; Mar. 4, 1987, 62-47708
Int. Cl.[5] G06F 11/00
U.S. Cl. 371—40.1 3 Claims

2. An error correction control system for a control memory in a microprogram-controlled data processor, comprising:

a control memory for storing microinstructions;

a microinstruction register in which data read out from said control memory is set;

an arithmetic circuit, operating in accordance with the contents of said microinstruction register;

a control circuit for determining an address of a microinstruction to be executed next in accordance with the microinstruction in said microinstruction register;

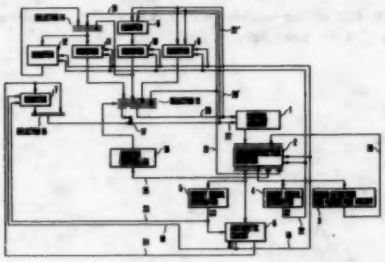
an error detection and correction circuit for adding error correction codes to the microinstructions and storing them in said control memory, detecting and correcting an error of the microinstruction set in said microinstruction register, and setting the corrected microinstruction in said microinstruction register;

inhibit signal generating means for, when a correctable error is detected by said error detection and correction circuit, generating a second inhibit signal for inhibiting updating said microinstruction register and a third inhibit signal for inhibiting an operation of said arithmetic circuit;

an address save register in which an address corresponding to the microinstruction set in said microinstruction register is set; and

a branch address save register in which branch information supplied from said arithmetic circuit is set,

wherein when a correctable error in a field containing next address information and an error correction code of the microinstruction is detected at the same time a first inhibit signal caused by said arithmetic circuit is generated, an



error correction sequence is inhibited by the first inhibit signal, the second inhibit signal is generated in a clock period in which the error is detected, the error correction sequence is begun at the same time the first inhibit signal is disabled, the third inhibit signal is generated at a timing one clock period after the second inhibit signal is generated, the second inhibit signal is disabled, and said microinstruction register is updated in accordance with the contents of said address save register and said branch address save register after the error correction sequence is completed, and then the third inhibit signal is disabled at a timing one clock period after the second inhibit signal is disabled, thereby restarting the operation of said arithmetic circuit.

4,955,024

HIGH SPEED IMAGE PROCESSING COMPUTER WITH ERROR CORRECTION AND LOGGING

David M. Pfeiffer, Plano; David T. Stoner, McKinney; John P. Norsworthy, Carrollton; Dwight D. Dipert, Richardson; Jay A. Thompson; James A. Fontaine, both of Plano, and Michael K. Corry, Dallas, all of Tex., assignors to Visual Information Technologies, Inc., Plano, Tex.

Division of Ser. No. 97,664, Sep. 14, 1987. This application Jan. 24, 1989, Ser. No. 301,372

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—40.1 **7 Claims**

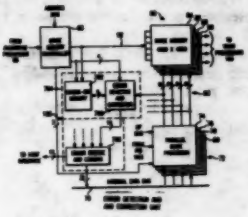
1. An image processing system comprising:

a plurality of planes of image memory for storing image data;

circuitry for addressing said memory planes for accessing said image data;

data processor circuits connected to respective memory planes by data lines;

a data error detector circuit coupled to said data lines for monitoring data transferred between said memory planes and said data processor circuits; and



circuitry for preventing said data processor circuits from processing image data found to be in error by said data error detector circuit.

4,955,025

FIBRE-OPTIC LASERS AND AMPLIFIERS

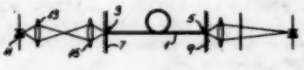
Robert J. Mears, 34 Thorold Road, Bitterne Park, Southampton, Hampshire SO2 4JB; Laurence Reekie, 117 Oaktree Road, Bitterne Park, Southampton, Hampshire SO2 4PJ; Simon B. Poole, 18 Union Road, Northam, Southampton, Hampshire SO2 OPU, and David N. Payne, 12 Redcroft Lane, Lowford, Bursledon, Southampton, Hampshire SO2 5NH, all of England

Continuation of Ser. No. 211,093, Jun. 10, 1988, abandoned, which is a continuation of Ser. No. 56,997, Apr. 9, 1987, abandoned. This application Mar. 20, 1989, Ser. No. 326,458

Claims priority, application United Kingdom, Aug. 13, 1985, 8520300; Aug. 13, 1985, 8520301

Int. Cl.[5] H01S *3/30*

U.S. Cl. 372—6 **6 Claims**



1. A fibre-optic laser comprising:

a resonant cavity including a length of silica glass optical fibre having a core and cladding, and incorporating active dopant ions in the core thereof; and,

a diode laser optical pump source coupled to said resonant cavity to inject continuous optical pumping radiation to propagate along said resonant cavity to stimulate continuous wave mode emission therefrom, wherein

the fibre is of a length of at least 5 cm, and of single-mode geometry and is of a type capable of sustaining single transverse mode propagation at emission wavelength; and,

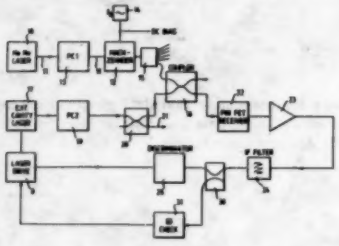
the active dopant ions, ions of a rare-earth or a transition metal, are incorporated in the fibre at a low-level uniform concentration (<900 ppm) the fibre providing an untra-low loss (<40dB/km) holst therefor.

4,955,026

FREQUENCY LOCKING RADIATION BEAM

Godfrey R. Hill, Ipswich; David W. Smith, and David J. Hunkin, both of Woodbridge, all of England, assignors to British Telecommunications public limited company, London, United Kingdom

Filed Nov. 12, 1987, Ser. No. 107,594
Claims priority, application United Kingdom, Jan. 28, 1986, 8602015; Jan. 28, 1986, 8602016
Int. Cl.[5] H01S 3/098
U.S. Cl. 372—18 13 Claims



1. A method of locking the frequencies of a plurality of first beams of coherent radiation at respective different and closely spaced frequencies, the method comprising:

generating a first beam of coherent radiation from each of a plurality of first sources of coherent radiation to produce a plurality of first beams having associated first beam frequencies;

generating a reference beam of coherent radiation composed of a plurality of reference frequencies, each reference frequency having a different value, and being spaced apart from each other reference frequency by a predetermined amount;

monitoring the difference between each first beam frequency and a respective one of the reference frequencies; and

modifying each of the first beam frequencies to maintain predetermined differences with respect to respective reference frequencies substantially constant, thereby locking each first beam at a frequency which differs from the frequency of each other first beam.

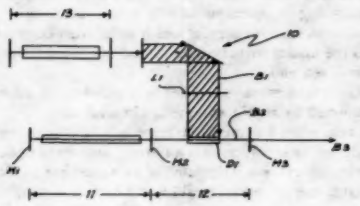
4,955,027

WAVELENGTH LOCKED LASER LIGHT SOURCE

James A. Piper, Pennant Hills, and Mark D. Ainsworth, Lane Cove, both of Australia, assignors to MacQuarie University, North Ryde, Australia

PCT No. PCT AU88/00040, § 371 Date Sep. 30, 1988, § 102(e) Date Sep. 30, 1988, PCT Pub. No. WO88/06358, PCT Pub. Date Aug. 25, 1988
PCT Filed Feb. 11, 1988, Ser. No. 257,291
Claims priority, application Australia, Feb. 11, 1987, PI0297
Int. Cl.[5] H01S 3/098
U.S. Cl. 372—18 24 Claims

1. In a wavelength locked pulsed laser system, the improvement comprising a low-power continuous wave laser disposed to inject a continuous wave, single wavelength, laser light emission therefrom into an optical cavity of a high power short pulse dye laser, the dye laser being transversely pumped by a beam line-focussed with respect to the continuous wave emission, the optical cavity of the pulsed dye laser further comprising a short cavity bounded by first and second mirrors aligned normal to a central axis, the mirrors having a coating for suppressing laser emissions of wavelengths other than those close to the continuous wave, single wavelength emission, whereby the wavelength of pulsed laser light emitted from the dye laser



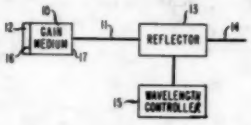
is locked at the wavelength of the continuous wave, single wavelength, laser light.

4,955,028

WAVELENGTH TUNABLE COMPOSITE CAVITY LASER

Rodney C. Alferness, Holmdel; Gadi Eisenstein, Middletown; Uziel Koren, Fair Haven; Ping K. Tien, Holmdel; Rodney S. Tucker, Howell, and Matthew S. Whalen, Rumson, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 25, 1988, Ser. No. 173,488
Int. Cl.[5] H01S 3/10
U.S. Cl. 372—20 8 Claims



1. A single wavelength optical source comprising a gain medium having first and second end surfaces opposite each other, said gain medium for generating optical signals over a substantially continuous range of wavelengths by spontaneous emission, a first reflector disposed on said first end surface of said gain medium, a single-mode optical fiber optically coupled to said gain medium through said second end surface, a second reflector comprising a portion of said single-mode optical fiber having a substantially flat, reduced cladding region over a predetermined length and a reflective filter means in close proximity with the reduced cladding region for evanescent optical coupling thereto, said first and second reflectors forming a single resonant optical cavity therebetween with said optical fiber and said gain medium disposed within said cavity, and means connected to said second reflector for dynamically controlling the reflective filter means to reflect toward said first reflector optical signals substantially at said single wavelength so that said source is tunable to any single wavelength in the continuous range of wavelengths spontaneously emitted by said gain medium.

4,955,029

PROCESS AND DEVICE FOR REGULATING THE LIGHT POWER OF LASER DIODES

Pierre Lecoy, 11 allee du Parc de la Biévre, 94240 L'Hay Les Roses, and Jean-Hubert Wilbrod, 8 rue Carnel de St Martin, 78150 Le Chesnay, both of France

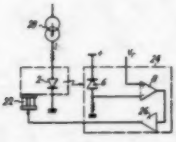
PCT No. PCT/FR84/00056, § 371 Date Nov. 9, 1984, § 102(e) Date Nov. 9, 1984, PCT Pub. No. WO84/03592, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 9, 1984, Ser. No. 682,355

Claims priority, application France, Mar. 9, 1983, 83 03873

Int. Cl.[5] H01S 3/13

U.S. Cl. 372—31 10 Claims



1. A process for regulating the light power emitted by a laser diode operating under continuous conditions, in which an electric signal representative of said light power is compared with an electric reference signal corresponding to a reference light power for deriving an error signal, and the operating conditions of the laser diode are automatically modified as a function of said signal, characterized in that the heat flow extracted from the laser diode is controlled so as to cancel out the error signal while supplying the laser diode with a constant electric current.

4,955,030

METHOD OF MANUFACTURING A SEMICONDUCTOR STRUCTURE SUITABLE FOR PRODUCING A MULTI-WAVELENGTH LASER EFFECT, AND DEVICE OBTAINED THEREBY

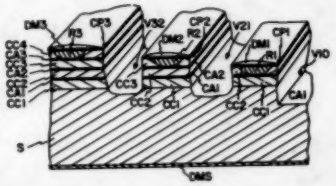
Louis Menigaux, Bures sur Yvette, and Louis Dugrand, Chelles, both of France, assignors to L'Etat Francais represente par le Ministre des Postes et Telecommunications and Centre National d'Etudes des Telecommunications, both of Meudlaeaux, France

Division of Ser. No. 224,879, Jun. 30, 1988, Pat. No. 4,925,811. This application Jun. 13, 1989, Ser. No. 365,357

Claims priority, application France, Oct. 23, 1986, 86 14740

Int. Cl.[5] H01S 3/19

U.S. Cl. 372—44 11 Claims



1. A semiconductor device comprising:

(a) a substrate;

(b) a monocrystalline double heterostructure stack deposited on said substrate (D), said stack comprising active layers (CA) having different compositions and having light radiating properties, each of said layers being sandwiched between two confinement layers (CC) having a microcrystal lattice size adjacent to that of the active layers, with all of said layers having the same conductivity type;

(c) selective etching on the top of the stack in parallel strips which are adjacent to one another, laying bare confinement layers (CC) at different depths, at least on two adjacent strips, with the confinement layers (CC) thus laid bare defining parallel terraces (T1, T2, T3) separated from one another by transitions (M12, M23);

(d) a contact layer (CP) formed on said terraces;

(e) an opposite conductivity type region (R1, R2, R3) in the strip included in each terrace formed by inserting impurities through the contact layer, said impurities corresponding to the same conductivity type as the contact layer and said region extending through the top confinement layer (CC2, CC3, CC4) to the vicinity of the active layer therebeneath (CA1, CA2, CA3) in order to constitute a P-N junction therewith (J1, J2, J3);

(f) individual metal contacts (DM1, DM2, DM3) on each opposite conductivity type region; and

(g) a common metal contact (DMS) on the substrate;

wherein the opposite conductivity type regions are electrically isolated from one another (V10, V21, V32) at the transitions therebetween, to form semiconductor structure stripes, and the opposite ends of said stripes are optically prepared transversely to the long dimension of the terraces.

4,955,031

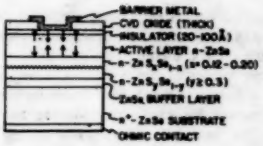
METAL INSULATOR SEMICONDUCTOR HETEROSTRUCTURE LASERS

Faquir C. Jain, Storrs, Conn., assignor to University of Connecticut, Storrs, Conn.

Filed Jul. 12, 1988, Ser. No. 217,637

Int. Cl.[5] H01S 3/19

U.S. Cl. 372—45 10 Claims



1. A metal insulator semiconductor (MIS) heterostructure laser emitting light in the blue region of the visible spectrum having the following strata extending along the length thereof:

(a) a substrate having at least its top surface portion formed by a compound selected from the group consisting of zinc selenide (ZnSe), zinc sulfoselenide (ZnSSe),zinc manganese selenide (ZnMnSe);

(b) a confining layer of a compound selected from the group consisting of zinc sulfoselenide (ZnSSe) and zinc manganese selenide (ZnMnSe);

(c) an active layer of a compound selected from the group consisting of n-type zinc selenide (ZnSe), n-type zinc sulfoselenide (ZnSSe) and n-type zinc manganese selenide (ZnMnSe);

(d) a thin insulator layer of a material having an effective energy gap which is greater than a lasing wave length;

(e) a top layer of alternating stripes of reflective barrier metal and thick insulating material, said thin insulator layer and barrier metal acting in concert to provide an inverted surface at the active layer; and

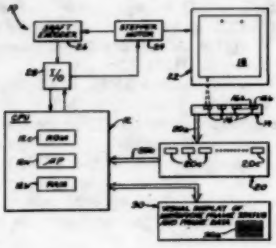
(f) an electrical contact on said substrate, thereby a potential applied across said top metal layer and substrate causes the barrier metal to inject minority holes into said active layer to produce photons from the recombination electrons and holes in said active layer, said photons being reflected from said confining layer and metal stripe of said top layer along the length thereof and being discharged from said active layer at an end of said layer.

4,955,032

METHOD AND APPARATUS FOR MAPPING FRAMES OF AN UPDATABLE ELECTROPHOTOGRAPHIC MEDIUM

J. Edward Potzler, Brookfield, and Daryl J. Strahan, Wilmette, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Apr. 22, 1988, Ser. No. 185,124
Int. Cl.[5] G06F 15/20; G03B 27/52
U.S. Cl. 364—525 17 Claims



1. Apparatus for electronically mapping imaged and unimaged frames on an updatable electrophotographic medium having a plurality of frames arranged in columns, each imaged frame having a detectable frame mark, comprising:

a. means for optically scanning all frames to detect said frame marks,

b. means for moving the medium relative to the scanning means so that each column of frames including any frame marks passes through an optical window of said scanning means;

c. said scanning means providing electrical output signals indicative of the presence or absence of a frame mark for each frame on said medium;

d. electronic memory means having a separate memory location corresponding to each frame on said medium;

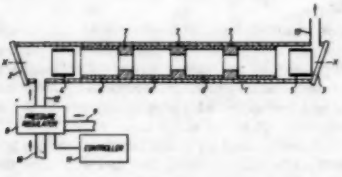
e. control means for retrievably storing in said memory means a first data value if a corresponding frame is imaged, and a second data value if its corresponding frame is unimaged.

4,955,033

METAL VAPOR LASER APPARATUS

Arthur Maitland, Fife, and Ewan S. Livingstone, Tayside, both of Scotland, assignors to EEV Limited, Chelmsford, United Kingdom

Filed May 4, 1989, Ser. No. 347,378
Claims priority, application United Kingdom, May 24, 1988, 8812276
Int. Cl.[5] H01S 3/22
U.S. Cl. 372—56 25 Claims



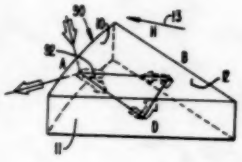
1. Metal vapour laser apparatus comprising an envelope having a longitudinal axis and containing surfaces of non-gaseous metal, and means arranged to flow a halogen gas through the envelope over the metal surfaces to produce a metal halide thereon, wherein the formed metal halide vaporizes and dissociates or heating to produce a metal vapour.

4,955,034

PLANAR SOLID STATE LASER RESONATOR

David G. Scerbak, Fremont, Calif., assignor to Electro-Optics Technology, Inc., Fremont, Calif.

Filed Mar. 1, 1989, Ser. No. 317,316
Int. Cl.[5] H01S 3/083
U.S. Cl. 372—94 50 Claims



1. A planar laser resonator comprising:

a single piece of solid-state laser medium;

means for reflecting optical energy within said laser medium defining a polygonal lasing path in a single lasing plane;

means for insuring a single spatial mode of oscillation of said optical energy; and

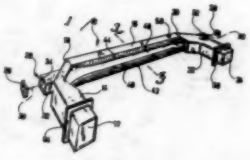
means for reciprocally rotating polarization of optical energy inclined to said lasing plane in said solidstate laser medium along said lasing path, said rotating means altering index of refraction along said lasing path to effect unidirectional propagation of said optical energy.

4,955,035

MICROWAVE-PUMPED, HIGH-PRESSURE, GAS-DISCHARGE LASER

Frank Gekat, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Deutsche Forschungs -und Versuchsanstalt fuer Luft- und Raumfaart eV., Bonn, Fed. Rep. of Germany

PCT No. PCT/DE88/00137, § 371 Date Nov. 14, 1988, § 102(e) Date Nov. 14, 1988, PCT Pub. No. WO88/07272, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 11, 1988, Ser. No. 276,445
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708314
Int. Cl.[5] H01S 3/09
U.S. Cl. 372—69 34 Claims



1. Microwave-pumped, high-pressure, gas-discharge laser, in particular, excimer laser, with an optical resonator, with a resonator gas volume arranged therein and extending along an optical axis thereof, with a microwave coupling structure enclosing the resonator gas volume within it and with a microwave generator connected to the microwave coupling structure, characterized in that a central area (62, 102) with an electric field intensity being above a threshold value for a high-pressure gas discharge is disposed within the resonator gas volume (52) in a transverse direction to the optical axis (30) and is adjoined on both sides thereof by outer areas (64, 104)

with a field intensity being below the threshold value for the high-pressure gas discharge.

4,955,036

SEMICONDUCTOR ARRANGEMENT FOR PRODUCING A PERIODIC REFRACTIVE INDEX DISTRIBUTION AND/OR A PERIODIC GAIN DISTRIBUTION

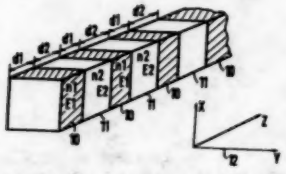
Albrecht Mozer, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 17, 1989, Ser. No. 324,682

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808875

Int. Cl.[5] H01S *3/08*

U.S. Cl. 372—96 14 Claims



1. In a semiconductor device for the amplification of light, said device having a given direction of propagation of an optical wave and including a sequence of semiconductor material layers disposed between a layer of n-type semiconductor material and a layer of p-type semiconductor material, and respective electrodes for said n-type and p-type layers, the improvement wherein: said sequence of semiconductor material layers comprises a periodic succession of layers of at least two different semiconductor materials with said succession of layers extending in said given direction of propagation of the optical wave, and with said semiconductor material of successive layers of said periodic succession having different refractive indices and different band gaps.

4,955,037

APPARATUS AND METHODS FOR RECOVERING ALIGNMENT FROM A NON-IDEALLY ENCODED MULTI-BIT DIGITAL SIGNAL

Milton M. Anderson, Fair Haven, and Orni Petruschka, Middletown, both of N.J., assignors to Bell Communications Research Inc., Livingston, N.J.

Filed Jan. 19, 1989, Ser. No. 300,116

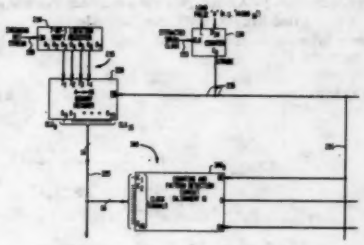
Int. Cl.[5] H04B *14/06*

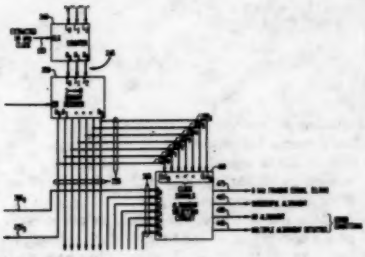
U.S. Cl. 375—27 26 Claims

1. A method for recovering alignment of a multi-bit non-ideally encoded digital signal comprising the steps of:

gathering statistics from a non-ideally encoded multi-bit digital signal, that occurs over a pre-defined measurement interval and for each one of a plurality of possible alignments of said encoded signal, and

choosing one of said alignments of said signal which satisfies a plurality of pre-defined statistical tests, that are dictated by non-uniform deterministic characteristics which occur in the encoded signal when it is properly aligned, comprising the step of generating an error signal if after the conclusion of said measurement interval either no alignment is





found that satisfies said plurality of pre-defined statistical tests of multiple ones of said alignments are found.

4,955,038

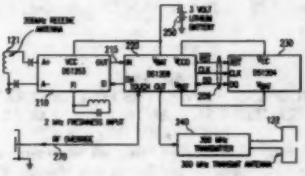
LOW-POWER RF RECEIVER

Robert D. Lee, Denton; Robert W. Mounger, Dallas, and John P. Heptig, Fort Worth, all of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Dec. 9, 1988, Ser. No. 282,819

Int. Cl.[5] H04B *1/22*

U.S. Cl. 375—35 12 Claims



1. A low-power RF receiver, comprising:

a battery;

at least two antenna circuits, tuned to a predetermined reception frequency;

at least two comparators, each having a respective pair of inputs directly connected to receive a low-level analog signal at said predetermined frequency from a respective one of said antenna circuits;

at least one digital logic stage, connected to be driven by the output of a selected one of said comparators and to provide a full digital output corresponding to the voltage received at said selected comparator;

said comparators and said logic stage being connected to be powered by said battery.

4,955,039

QUADRATURE RECEIVER

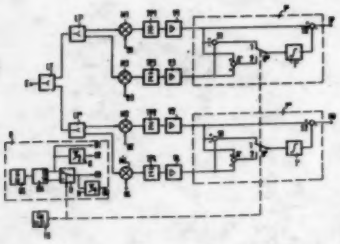
Dietrich Rother, Tamm; Bernd Ripka, Tiefenbroon-Muhlhausen, and Rainer Berger, Albstadt, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed May 3, 1989, Ser. No. 346,780

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815055

Int. Cl.[5] **H03D** *1/22*

U.S. Cl. 375—75 **8 Claims**



1. A quadrature receiver comprising:

oscillator means for producing:

a first oscillator signal,

a second oscillator signal which differs in phase by 90 from the first oscillator signal,

a third oscillator signal alternately in phase with and in phase opposition to the first oscillator signal, and

a fourth oscillator signal alternately in phase with and in phase opposition to the second oscillator signal;

a first mixer for mixing a received signal with the first oscillator signal;

a second mixer for mixing the received signal with the second oscillator signal;

a third mixer for mixing the received signal with the third oscillator signal;

a fourth mixer for mixing the received signal with the fourth oscillator signal;

first circuit means having a first input coupled to an output from the first mixer and a second input coupled to an output of the third mixer for providing an in-phase signal; and

second circuit means having a first input coupled to an output of the second mixer and a second input coupled to an output of the fourth mixer for providing a quadrature signal.

4,955,040

METHOD AND APPARATUS FOR GENERATING A CORRECTION SIGNAL IN A DIGITAL CLOCK RECOVERY DEVICE

Imre Sarkoezi, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

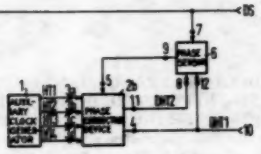
Filed Oct. 14, 1988, Ser. No. 257,559

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736351

Int. Cl.[5] **H03D** *3/24*

U.S. Cl. 375—119 **10 Claims**

1. A method for generating a correction signal K when a defined phase interval occurs between a digital signal DS and a first auxiliary data clock signal DHT1 which is the recovered clock of the digital signal DS, which has been selected and, which has a phase relationship which changes relative to one of several auxiliary clocks HT1–HTm which are shifted equal phase angles relative to each other where m is an integral number, comprising, the steps of generating a second auxiliary data clock DHT2 which has the same frequency as said first auxiliary data clock signal and which is shifted in phase by a fraction n/m from the first auxiliary data clock DHT1, messuring the phase angle between the first edges of the pulses of said digital signal DS and said second auxiliary data clock DHT2



where n = integral number, n ≦ m and producing the correction signal K as an output if no phase angle is detected and shifting from one clock signal to the other in response to the correction signal K.

4,955,041

ELECTRONIC PULSE COUNTER FOR SIMULTANEOUS DOWNWARD AND UPWARD COUNTING

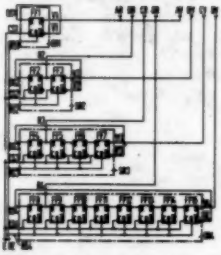
Josef Hoelzle, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 304,190

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802530

Int. Cl.[5] **H03K** *21/12, 23/86*

U.S. Cl. 377—54 **5 Claims**



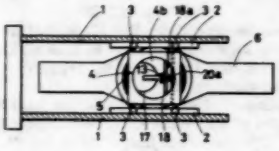
1. Electronic pulse counter, comprising a given number of shift registers each having a different number of memory elements, an input, an output and a clocking line; each of said shift registers being counter-coupled by means of a negation between said input and said output thereof; a pulse counter input formed by interconnection of said clocking lines of all of said shift registers; and pulse counter outputs formed by said outputs of said shift registers, wherein said memory elements of each of said shift registers include a first memory element, said outputs of said first memory elements of each of said shift registers form further pulse counter outputs, said given number of memory elements of said shift registers is equal to powers of 2, beginning with the power 0, said first outputs form an upward counter, and said further outputs form a downward counter, whereby simultaneous downward and upward counting are provided.

4,955,842

DENTAL RADIOGRAPHIC APPARATUS FOR PHOTOGRAPHING ENTIRE JAWS

Kazuo Nishikawa, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Continuation of Ser. No. 235,776, Aug. 23, 1988, abandoned, which is a continuation of Ser. No. 940,947, Dec. 12, 1986, abandoned, which is a division of Ser. No. 667,769, Nov. 2, 1984, abandoned. This application Jun. 5, 1989, Ser. No. 363,422
Claims priority, application Japan, Nov. 12, 1983, 58-212992
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[5] G03B 41/16
U.S. Cl. 378—39 2 Claims



1. A dental radiographic apparatus for photographing the entire jaws in which the apparatus includes a rotary arm having an X-ray source at one end and an X-ray film cassette at the other end thereof and a means for sequentially shifting the center of rotation of the X-ray beam irradiated from the X-ray source upon the X-ray film cassette such that a path of movement of said X-ray beam with respect to a substantially elliptical locus of a dental arch describes a symmetrically extending approximately triangular envelop projecting toward the front tooth region of the substantially elliptical dental arch, said apparatus being characterized in that it comprises a means for changing a straight-line distance on a medial line of the human body between an apex of said triangular envelop and a line joining receding points of limit of the triangular envelop to change a major axis of the elliptical locus of the dental arch, said means for changing the straight-line distance varies the position of the apex of the triangular envelop without changing a minor axis of the approximately elliptical locus of the dental arch and the position of the line joining the receding points of limit of the triangular envelop.

4,955,843

X-RAY DIAGNOSTICS INSTALLATION

Anton Nekovar, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,153
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732634
Int. Cl.[5] H05G 1/44
U.S. Cl. 378—108 6 Claims

1. An x-ray diagnostics installation for examining a subject comprising:

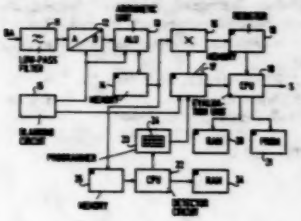
means for exposing an examination subject to an x-ray dose;

means for generating an x-ray image from x-radiation attenuated by said subject;

means for generating video signals comprising a video image from said x-ray image;

a processing circuit, connected to said means for generating video signals, to which said video signals are directly supplied, including weighting means for assigning respectively different weighting factors to video signals corresponding to different regions of said video image to form weighted image regions, and means for combining said weighted image regions to form an actual value signal, said processing circuit connected to said means for exposing so as to supply said actual value signal thereto to control said x-ray dose; and

said video image consisting of a plurality of picture elements, and said processing circuit further including data reduc-



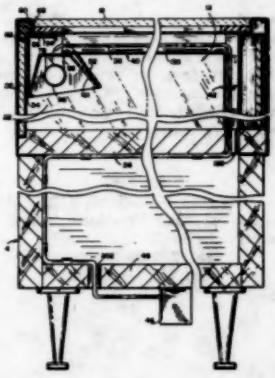
tion means for combining respective portions of video signals corresponding to said plurality of picture elements to form said image regions, said data reduction means preceding said weighting means in said processing circuit.

4,955,844

LIGHTED DISPLAY CASE

Douglas D. Amstutz, Muskegon, and Ronald A. Vanderboegh, Twin Lakes, both of Mich., assignors to Amstore Corporation, Muskegon, Mich.

Filed Dec. 2, 1988, Ser. No. 279,591
Int. Cl.[5] A47F 11/10
U.S. Cl. 362—125 28 Claims



1. A display case comprising:

a framework;

a plurality of panels supported by said framework and defining therewith an enclosure;

a light fixture for illuminating the enclosure said light fixture including a housing defining at least one opening therethrough; and

mounting means for applying a biasing force to said light fixture and engaging and resiliently urging said light fixture against a portion of said case to thereby releasably attach said light fixture thereto, said mounting means extending through said opening for releasably mounting said light fixture, said biasing force applied by said mounting means being easily overcome by manual pressure so that said mounting means can be resiliently moved away from said portion of said case when said light fixture is removed from and attached to said framework.

4,955,045

PLASMA X-RAY TUBE, IN PARTICULAR FOR X-RAY PREIONIZATION OF GAS LASERS AND METHOD FOR PRODUICNG X-RADIATION WITH SUCH AN X-RAY TUBE

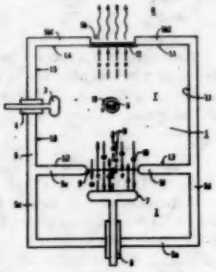
Dirk Priede, Herzogenaurach; Hans-Juergen Cirkel, Uttenreuth; Rudolf Baumgartl, Alzenau-Hörstein, and Matthias Schmutzler, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,700

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811818; Feb. 14, 1989, 3904417

Int. Cl.[5] H01J *35/00*

U.S. Cl. 378—122 18 Claims



15. Method for generating X-radiation, in a plasma X-ray tube with high electron current densities including a plasma chamber formed of a metal hollow cathode with an X-ray target and a metal acceleration grid, an ignition electrode and an anode in the plasma chamber, an acceleration chamber, and an acceleration cathode in the acceleration chamber, which comprises varying acceleration voltage and current by varying current in the hollow cathode and gas pressure, without changing their electrical excitation data.

4,955,046

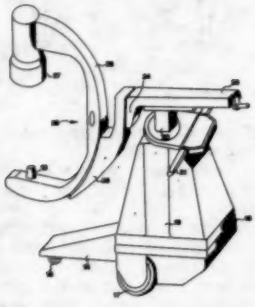
C-ARM FOR X-RAY DIAGNOSTIC EXAMINATION

Aldona A. Siczek, and Bernard W. Siczek, both of 1252 Chinook Way, Boulder, Colo. 80303

Filed Apr. 17, 1989, Ser. No. 338,945

Int. Cl.[5] H05G *1/02*

U.S. Cl. 378—197 13 Claims



1. A C-arm X-ray apparatus for use in diagnostic examinations comprising: a C-arm being an arc-shaped member having an image source and an image receptor mounted on opposite ends thereof, a vertical structure for supporting said C-arm, wherein said structure is moveably mounted on a base means and connected to a drive means for vertical displacement, a counter-balancing means for a vertical movement comprising a torsion spring connected to a first drum, said torsion spring and said first drum mounted on a first shaft secured on opposite ends to said base means, a second drum mounted on a second shaft secured to said base means and connected to said first drive means and further coupled to said first drum so that the rotation of said second drum causes the rotation of said first drum and further causes said torsion spring to store the rotation energy while the C-arm is being lowered and to release that stored energy when said C-arm is being raised.

4,955,047

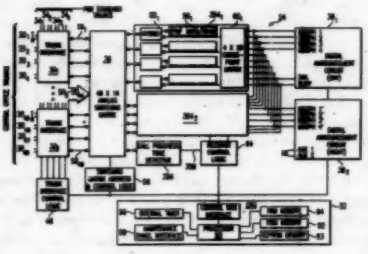
AUTOMATED ATTENDANT WITH DIRECT INWARD SYSTEM ACCESS

Sanford J. Morganstein, Elgin; Ron H. Bindl, Downers Grove; Mark D. Klecka, Kekalb; Herbert B. Krukau, Elmhurst, and Thomas M. Dawson, Lisle, all of Ill., assignors to Dytel Corporation, Schaumburg, Ill.

Continuation-in-part of Ser. No. 99,388, Sep. 21, 1987, which is a continuation of Ser. No. 593,526, Mar. 26, 1984, Pat. No. 4,696,028. This application May 2, 1989, Ser. No. 346,167

Int. Cl.[5] H04M *3/38, 3/50, 15/12*

U.S. Cl. 379—112 8 Claims



1. Apparatus for connecting an outside caller to an extension of a local exchange having a direct inward system access (DISA) feature, comprising:

a processor;

a memory coupled to said processor storing at least one predetermined security code;

a dialing information receiver controlled by said processor for receiving dialing information including a group code input from an outside caller;

a memory coupled to said processor and said receiver for storing said dialing information, and storing second dialing information including the extension number of said extension, said processor operable to correlate said dialing information with said second dialing information; and

a transmitter coupled to said processor and said local exchange for transmitting said security code and second dialing information to said local exchange.

4,955,048

MULTIPLEX TRANSMISSION OF AUDIO SIGNAL AND VIDEO SIGNAL THROUGH INHOUSE CABLE

Soichi Iwamura, Fuchu; Satoshi Murakami, Nagareyama, and Tadashi Itsumi, Kashiwa, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 43,757, Apr. 29, 1987, abandoned. This application Mar. 13, 1989, Ser. No. 323,197

Claims priority, application Japan, Apr. 30, 1986, 61-100185; Apr. 30, 1986, 61-100187

Int. Cl.[5] H04M *11/00*; H04N *7/14*

U.S. Cl. 379—53 15 Claims

1. A method for transmitting and receiving multiplexed

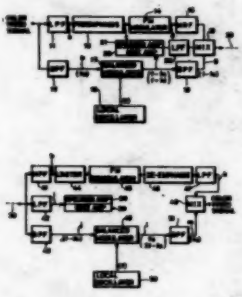
audio-video signals between two sets of transmitters/receivers, one transmitter/receiver set at each of a first and second station, by a pair of telephone communication cables, by multiplexing baseband audio signals and video signals, the baseband audio signals being bidirectional, comprising the steps of:

(a) frequency modulating the video signals at said first station with a first low frequency carrier;

(b) multiplexing the frequency-modulated video signals of step (a) with the baseband audio signals at said first station;

(c) frequency modulating the video signals of said second station with a second low frequency carrier, different from said first low frequency carrier;

(d) multiplexing the frequency-modulated video signal of



step (c) with baseband audio signals at said second station such that said multiplexed signals at each of said first and second stations both operate at different frequencies;

(e) simultaneously transmitting each of the multiplexed signals of steps (b) and (d) through the pair of telephone communication cables in a bidirectional manner;

(f) separating the multiplexed signals of step (d) and (b) into audio signals and frequency-modulated video signals at each of said first and second stations respectively;

(g) removing an amplitude component from each of the separated frequency-modulated video signals of step (f);

(h) frequency demodulating each of the frequency modulated video signals of step (g), thereby allowing bidirectional transmission of the audio and video signals.

4,955,049

METHOD OF SUPERVISING MOBILE TELEPHONE SUBSCRIPTIONS IN A MOBILE TELEPHONE SYSTEM

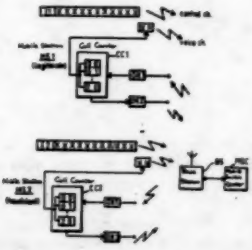
Walter Ghisler, Upplands Väsby, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 8, 1989, Ser. No. 404,572

Claims priority, application Sweden, Aug. 11, 1989, 8902715

Int. Cl.[5] H04Q 7/04

U.S. Cl. 379—58 **3 Claims**



1. A method of supervising mobile telephone subscriptions in a mobile telephone system including a number of mobile stations (MS1, MS2) and at least one fixed station (MSC), characterized in

assigning to each mobile station (MS1) a first predetermined sequence of numbers and numbering the calls chargeable to a particular subscription by said first sequence of numbers,

signalling these numbers from the mobile station (MS1) to the fixed station (MSC) in a second predetermined sequence (NN), one number for each paying call when a call is made,

recording said second predetermined sequence (NN) of numbers together with the subscription number and a certain point of time.

4,955,050

SYSTEM CONFIGURATION OF WIRELESS PBX AND COMMUNICATION METHOD THEREFOR

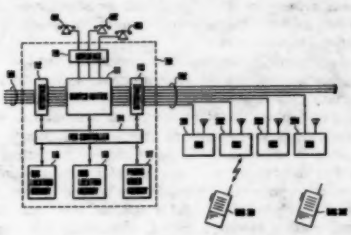
Yukiji Yamauchi, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 31, 1989, Ser. No. 331,298

Claims priority, application Japan, Apr. 1, 1988, 63-78008

Int. Cl.[5] H04Q 7/04

U.S. Cl. 379—59 **8 Claims**



1. A system configuration of wireless PBX comprising:

a plurality of portable radio mobile means;

a plurality of radio base means connectable via radio channels to said portable radio mobile means for linking communications between said portable mobile means;

a private branch exchange connected via wire lines to said radio base means for supervising a relationship of interconnections among said portable radio mobile means;

each of said radio mobile means including means for generating a signal at a predetermined time interval, said signal containing a first identification number specifically assigned beforehand to each of said radio mobile means;

each of said radio base means including means for forming a packet upon reception of said signal and sending said packet to said private branch exchange, said packet being composed of said first identification number contained in said signal and a second identification number specifically assigned to each of said radio base means; and

said private branch exchange including a first memory for storing said first and second identification numbers contained in said packet received from said radio base means, while retaining a correspondence between said first and second identification numbers;

wherein when a subscriber to a first radio mobile means requests a communication by designating a second radio mobile means, said private branch exchange refers to said first memory and connects said first radio mobile means to said second mobile means via a radio base means in correspondence with said second radio mobile means; and

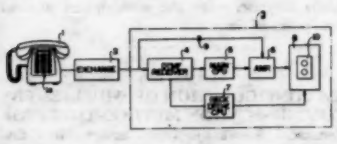
when said subscriber to said first radio mobile means requests a communication by designating an arbitrary radio base means, said private branch exchange refers to said first memory and connects said first radio mobile means to a specified radio mobile means in correspondence with said specified radio base means.

4,955,051

DICTATING APPARAUS WHICH IS REMOTELY CONTROLLED UTILIZING A PUSH-BUTTON TELEPHONE

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Sep. 22, 1987, Ser. No. 99,473
Claims priority, application Japan, Sep. 24, 1986, 61-225213
Int. Cl.[5] H04M *1/65, 11/10*; G11B *15/18*
U.S. Cl. 379—75 12 Claims



1. A telephone dictating apparatus operable in record, playback, stop and rewind modes, said apparatus comprising:

a hand held control device having a control switch movable into record, playback, stop and rewind positions having a predetermined spatial relationship;

control means for switching said dictating apparatus between said modes as a function of the position of said control switch; and

telephone signal receiving means responsive to four DTMF signals generated by a telephone and transmitted to said dictating apparatus over telephone lines, said telephone having a plurality of push-buttons arranged in a spatial relationship, said telephone generating respective DTMF signals in response to the depression of respective ones of said push-buttons, said four DTMF signals being generated in response to the depression of four respective ones of said push-button of said telephone, said four respective push-buttons having a spatial relationship with respect to one another which is substantially the same as the spatial relationship of the record, playback, stop and rewind positions of said control switch; said telephone signal receiving means causing said control means to switch said dictating apparatus between said record, playback, stop and rewind modes in response to the receipt of a respective one of said four DTMF signals generated by the depression of the one of said push buttons in a spatial position corresponding to the spatial position of the control switch of the hand held control device which activates the desired mode, such that there is a one-to-one spatial correspondence between the functions of said four respective push buttons of said telephone and the functions of said four respective positions of said control switch of said hand held control device.

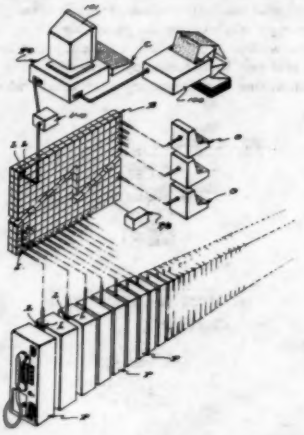
4,955,052

PAY PHONE SYSTEM AND APPARATUS

Syed Hussain, 1920 Shipway Ave., Long Beach, Calif. 90815

Filed Jul. 27, 1989, Ser. No. 385,407
Int. Cl.[5] H04M *17/02, 11/00*
U.S. Cl. 379—94 9 Claims

9. In a coin-operated pay phone that is connected with a related central switching device on a related central switching board by a pair of telephone lines and wherein a normally open loop circuit through the pay phone, switching device and telephone lines is closed to put the pay phone in operation and enable it to be connected with another telephone by a normally open hook-switch in the pay phone that closes when a user of the pay phone manipulates a part thereof that operates to close the hook-switch; the pay phone next includes a coin counting device connected with parts in the pay phone and that includes a microcomputer that receives and stores in its memory data pertaining to the coinage deposited in and handled by the pay phone and that operates to impose the data stored thereby on the operating voltage on the telephones lines in response to command signals directed to it by a monitoring computer connected with the switching board while the hook-switch remains open, the monitoring computer operates to connect with the pay phone by first causing the switching device thereof to direct intermittent ring signals to the pay phone, the coin counting device includes a pair of extension lines each connected with one of the telephone lines and a normally open



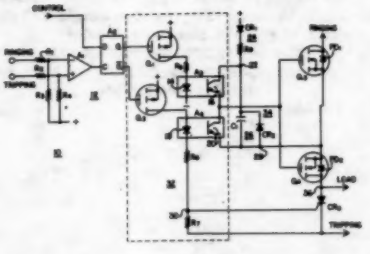
relay switch engaged with and between the extension lines, the counting device has a coupler that receives the intermittent ring signals and that directs corresponding digital ring signals to the microcomputer, the microcomputer is programmed to direct an operating voltage to the relay switch and cause closing of the switch and loop circuit and connection between the pay phone and monitoring computer when a predetermined number of digital ring signals have been directed to it.

4,955,053

SOLID STATE RINGING SWITCH

Gary G. Siegmund, Elyria, Ohio, assignor to Reliance Comm/-Tec Corporation, Chicago, Ill.

Filed Mar. 16, 1990, Ser. No. 496,068
Int. Cl.[5] H04M *3/02*
U.S. Cl. 379—253 15 Claims



12. A switch for alternately providing to a load a signal from a ringing generator for a predetermined time interval and a tripping signal for a predetermined time interval, said switch comprising:

(a) means for determining when said ringing signal crosses said tripping signal in a predetermined direction and generating a signal indicative thereof;

(b) means for synchronizing said indicative signal to a periodic control signal representative of said preedetermined

ringing time interval and generating a first output signal when said indicative signal occurs in said predetermined ringing time interval;

(c) first power output switching means having a closed state which places a substantially constant and low impedance in series with said ringing generator for providing said ringing signal to said load;

(d) second power output switching means having a closed state for providing said tripping signal to said load; and

(e) means responsive to said synchronizing means first output signal for generating from said ringing signal without introducing any perceptible distortion therein a signal for driving said first power output means into said closed state.

4,955,054

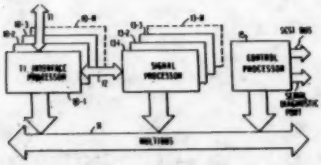
INTEGRATED TELECOMMUNICATION SYSTEM WITH IMPROVED DIGITAL VOICE RESPONSE

Ferrell W. Boyd, Jr., Clearwater; Michael Murdock, Pinellas Park; Michael McCormack, Tampa, all of Fla., and Paul Darbee, Santa Ana, Calif., assignors to Precision Software Incorporated, Clearwater, Fla.

Filed Oct. 5, 1988, Ser. No. 253,470

Int. Cl.[5] H04M *3/50*; H04Q *11/04*

U.S. Cl. 379—269 **5 Claims**



1. An integrated telecommunication system for multiple telephone line response and processing comprising:

a plurality of interface processor circuits, each of which is adapted to control the physical connection to a plurality of telephone line channels and control communication on a group of said telephone line channels connected thereto. each said interface circuit including a high speed interface control microprocessor and a first data storage associated therewith,

a plurality of signal processor circuit means, each said signal processor circuit means including crosspoint switch means for receiving multiple line mutiple channel inputs and producing corresponding multiple line multiple channel outputs, and a high speed digital signal microprocessor for analyzing the incoming signals and compressing the data therein, and a second data storage associated therewith, for controlling one or more telecommunication function circuits,

a main system control microprocessor,

a first bus system for connecting said plurality of interface processor circuits to said plurality of signal processor circuit means, and

a second bus system for connecting each of said plurality of interface processor circuits to each of said plurality of signal processor circuit means and to said main system control microprocessor,

whereby the high speed processing requirements of each said group of telephone lines is performed by said interface processor circuits and said digital signal microprocessor and said main system control microprocessor controls the storage of data in said first and second data storages and intercommunication functions between said plurality of interface processor circuits and said plurality of signal processor circuit means and said one or more telecommunication function circuits controlled thereby.

4,955,055

LOUDSPEAKING TELEPHONE WITH A FREQUENCY SHIFTING CIRCUIT

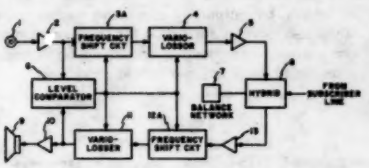
Hisashi Fujisaki, and Keiko Shimada, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Mar. 8, 1988, Ser. No. 165,629

Claims priority, application Japan, Mar. 12, 1987, 62-55129

Int. Cl.[5] H04M *9/08*

U.S. Cl. 379—390 **4 Claims**



1. A voice switched type loudspeaking telephone comprises:

means for comparing the levels of a sending voice signal and a receiving voice signal to produce a level comparison between said levels;

first frequency shifting means in a transmitting path responsive to said level comparison for frequency-shifting a signal in said transmitting path;

second frequency shifting means in a receiving path responsive to said level comparison for frequency-shifting a signal in said receiving path;

first level control means in said transmitting path responsive to said level comparison for level-controlling a signal in said transmitting path; and

second level control means in said receiving path responsive to said level comparison for level-controlling a signal in said receiving path.

4,955,056

PATTERN RECOGNITION SYSTEM

Frederick W. M. Stentiford, Woodbridge, England, assignor to British Telecommunications public company limited, London, England

Filed Jul. 16, 1986, Ser. No. 886,072

Claims priority, application United Kingdom, Jul. 16, 1985, 8517918

Int. Cl.[5] G10L *5/06*

U.S. Cl. 381—43 **16 Claims**

1. Speech recognition apparatus comprising:

(a) input means for receiving, in successive overlapping temporal portions, an electrical signal containing speech data;

(b) a feature detection device responsive to said electrical signal over a temporal portion thereof for detecting the presence of a plurality of predetermined features within said portion; and

(c) decision means for indicating recognition of elements of speech, each said element corresponding to the presence of a predetermined combination of said detected features, the said decision means including:

(i) assignment means for assigning a label corresponding to one of said elements of speech to each said portion in dependence on the features detected therein, together with a corresponding confidence measure indicating the

degree of confidence in the correctness of the assignment of that label;

(ii) an output buffer connected to said assignment means for storing values corresponding to a plurality of said successive portions forming a temporal array, said values comprising, for each said portion, timing information defining the relative position in time of that portion, and the label and corresponding confidence measure assigned to that portion; and

(iii) output means for indicating recognition of an element of speech, by outputting from said output buffer the labels and timing information for those portions in said array whose corresponding successive confidence measures define local maxima in said array.

4,955,057

REVERB GENERATOR

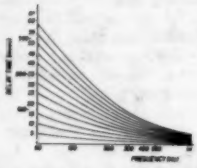
Noboru Tominari, Tokyo, Japan, assignor to Dynavector, Inc., Tokyo, Japan

Filed Feb. 4, 1988, Ser. No. 152,280

Claims priority, application Japan, Mar. 4, 1987, 62-49472; Apr. 13, 1987, 62-88644

Int. Cl.[5] G10H *1/04*

U.S. Cl. 381—63 **8 Claims**



1. A reverb generator for generating a plurality of reverberations responsive to an input audio signal, comprising:

time delay means having a single input port for receiving said input audio signal and a single output port for outputting said input audio signal as an output signal after a predetermined delay time;

means defining a feed back path for feeding back said output signal of said time delay means from said output port to said input port; and

phase shifting means connected in series to said delay means for applying dispersion to the output audio signal, said phase shifting means comprising a cascaded connection of a plurality of phase shifting elements each producing increased phase delay with increased frequency over the entire frequency range of said input audio signal.

4,955,058

APPARATUS AND METHOD FOR EQUALIZING A SOUNDFIELD

Eugene Rinkelt, 4438 SW. Hewett, Portland, Oreg. 97221, and Richard Schomburg, Rte. 2, Box 444, Hillsboro, Oreg. 97123

Continuation-in-part of Ser. No. 8,617, Jan. 29, 1987, Pat. No. 4,785,475. This application Aug. 8, 1988, Ser. No. 229,616

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] H03G *5/00*

U.S. Cl. 381—103 **16 Claims**

1. Apparatus for equalizing a soundfield, comprising:

an amplifier,

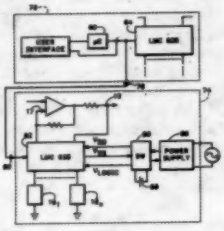
a gain control circuit for selectively adjusting the frequency response of the amplifier in response to data values received by the gain control circuit,

an input port for receiving data values,

an electronic storage device for storing data values received by way of the input port and applying those data values to the gain control circuit, and

power supply terminals for supplying operating current from an external power source to the electronic storage device,

the stored data values being maintained in the apparatus



upon interruption of the supply of operating current to the power supply terminals, and the apparatus having no manually actuable controls for selectively adjusting the stored data values.

4,955,059

SPEAKER POWER MATCHING METHOD AND APPARATUS

Harold W. Mech, Albuquerque, N. Mex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1989, Ser. No. 330,248

Int. Cl.[5] H04R *3/00*

U.S. Cl. 381—116 **8 Claims**

1. A transmitting system comprising:

at least one transmitting source means for generating signals to produce generated signals;

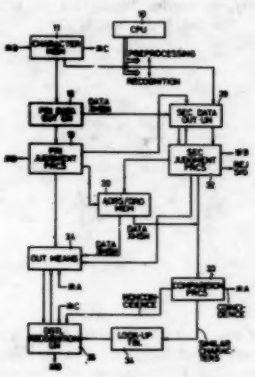
a plurality of transmitting transducer means having substantially capacitance impedance characteristics for transmitting at least a portion of the generated signals; and

a plurality of capacitance means each having substantially single pole impedance characteristics, for dividing the generated signals between the capacitance means and the transmitting transducer means, wherein each of the plurality of capacitance means is electrically coupled in series to one of the plurality of transmitting transducer means to produce a plurality of series coupled transmitting transducer means and capacitance means and wherein the plurality of series coupled transmitting transducer means and capacitance means are electrically coupled in parallel to the at least one signal source, such that sound pressure levels of the transmitting transducer are limited.

4,955,060
IMAGE RECOGNITION APPARATUS

Kazuo Katsuki, Osaka, Japan; Norman A. Peppers, Belmont, Calif.; James R. Young, Palo Alto, Calif.; Gerald A. Pierce, Redwood City, Calif., and Hisami Nishi, Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jul. 2, 1987, Ser. No. 69,310
The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—32 19 Claims



1. An image recognition apparatus comprising, optical image recognizing means for performing image recognition processing including an optical process and electronic image recognizing means for performing electronic digital processing;

said optical image recognizing means being arranged to optically multiply an input image to be recognized to form simultaneously in parallel a plurality of optical pattern images of substantially an identical shape, to simultaneously perform image information detection processing, thereby detecting a plurality of image information data corresponding to the plurality of optical pattern images, and to identify the input image on the basis of the plurality of image information data;

said electronic image recognizing means being arranged to perform digital correlation calculations between digital pattern data representative of the input image and digital pattern data representative of a plurality of reference images and to identify the input image;

said optical image recognizing means comprising;

(1) a first optical processing line including projection feature extracting means for extracting projection features of the optical pattern images and primitive pattern extracting means for extracting primitive patterns included in the optical pattern images, simultaneously in parallel with the extraction of said projection features;

(2) a second optical processing line including optical correlation calculating means for performing optical correlation between the optical pattern images and the reference image patterns, independently of and in parallel with said first optical processing line as well as by use of a different reference data base from the reference data base that is used for said first optical processing line; and

(3) a third optical processing line for reinforcing functions of said first and second optical processing lines;

said first optical processing line comparing the projection feature data of the input image which are output from said projection character extracting means, and the primitive feature data of the input image which are output from said primitive feature extracting means, respectively with the reference data of the reference images in order to determine the input image;

said second optical processing line being arranged to cause said optical correlation calculating means to perform the optical correlation calculations to determine the input image;

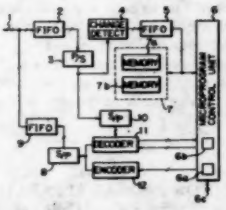
said third optical processing line being arranged such that the image information data from said first optical processing line and the image information data from said second optical processing line are collated and the input image is determined according to a result of the collation; and

the digital correlation calculations by said electronic image recognizing means being supplementally performed for limited ones of the reference images according to the image information data obtained by said optical image recognizing means, when the input image cannot be identified by the result of the determination of said third optical processing line.

4,955,061
METHOD AND APPARATUS FOR PROCESSING AN IMAGE SIGNAL

Tetsuo Doi, Kanagawa, and Takashi Funahashi, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 856,456, Apr. 25, 1986, abandoned. This application Dec. 6, 1988, Ser. No. 281,904
Claims priority, application Japan, Apr. 27, 1985, 60-091382; Apr. 30, 1985, 60-092919; Apr. 30, 1985, 60-092920
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 5 Claims



1. An apparatus for processing an image signal comprising:

data input circuit means for receiving input image data having first and second binary values;

encoding circuit means for encoding said input image data into compressed code data; and

data output circuit means for outputting said compressed code data,

wherein said encoding circuit means includes

(i) first detecting circuit means for detecting transition points where the value of said input image data changes from one to another of said first and second binary values,

(ii) counter means for generating addresses of said transition points of said input image data,

(iii) second detecting circuit means for detecting if the value of said input image data does not change during a time period exceeding a predetermined period,

(iv) control means for controlling said counter means so as to count at a faster than normal speed until a predetermined number is reached during each predetermined period when the value of the input image data does not change during a period exceeding the predetermined period, and

(v) encoder means for encoding said input image data by using said addresses of said transition points of said input image data.

4,955,062

PATTERN DETECTING METHOD AND APPARATUS

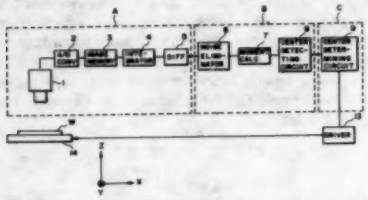
Hiroshi Terui, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 130,449, Dec. 9, 1987, abandoned. This application Jul. 18, 1989, Ser. No. 382,037

Claims priority, application Japan, Dec. 10, 1986, 61-294362; Dec. 10, 1986, 61-294363

Int. Cl.[5] G06K 9/03, 9/20

U.S. Cl. 382—8 2 Claims



2. A method of detecting the position of a linearly extending pattern, with respect to a predetermined direction perpendicular to the lengthwise direction of the pattern, said method comprising the steps of:

irradiating the pattern with a radiation beam;

forming on an image pickup surface of an image pickup device an image of the pattern by using the beam irradiated from the pattern;

setting a plurality of different windows to the image pickup surface;

processing image data in each window to detect, in each of the different windows, a center of the pattern with respect to the predetermined direction; and

determining the position of the pattern with respect to the predetermined direction, on the basis of results obtained by data processing made in relation to the different windows.

4,955,063

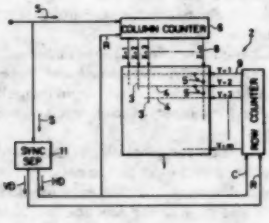
VECTOR DISPLAY APPARATUS

Gerald A. Pierce, Redwood City, Calif., assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 30, 1989, Ser. No. 332,420

Int. Cl.[5] G06K 9/46

U.S. Cl. 382—18 7 Claims



1. A vector display apparatus for displaying vectors as an optical pattern used in an image recognition system, each of said vectors having components which represent an intensity distribution of the projection obtained by projecting an image to be recognized onto an imaginary axis, said apparatus comprising:

a two-dimensional display panel including light-emitting elements arranged in a matrix form;

driving means for driving said light-emitting elements to turn on ones of said light-emitting elements located at positions corresponding to the magnitudes of the components of each of said vectors with an area assigned to the vector in said display panel.

4,955,064

GRAPHIC EDGE EXTRACTING APPARATUS

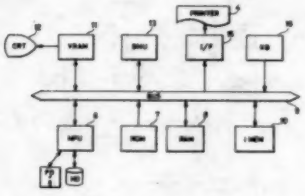
Akifumi Shirasaka, Yokohama; Kunio Seto, Inagi; Masaki Hamada, Tokyo, and Yukari Shibuya, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,598

Claims priority, application Japan, Oct. 20, 1986, 61-250306

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—22 9 Claims



1. A graphic edge extracting apparatus comprising:

memory means for storing graphic image data; and

graphic edge pixel extracting means for developing the graphic image data on a bit plane in a bit map memory of said memory means and executing a plurality of bitblt (bit block transfer: synthesis during drawing) processings, the bitblt processings including shifting of the relative position of the graphic image data as a whole, to extract inner edge pixels of the graphic image.

4,955,065

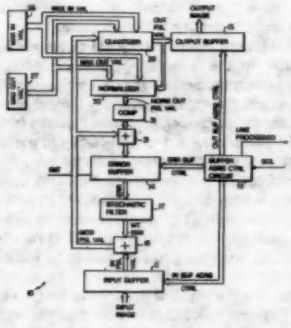
SYSTEM FOR PRODUCING DITHERED IMAGES FROM CONTINUOUS-TONE IMAGE DATA

Robert A. Ulichney, Cambridge, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 26,588, Mar. 17, 1987, abandoned. This application Oct. 18, 1989, Ser. No. 441,331

Int. Cl.[5] G06K 9/38

U.S. Cl. 382—50 16 Claims



1. An image processing system for processing continuous tone pixel image values from a data source representing an image, the image being represented by a plurality of lines of pixels, with each line including a plurality of pixels, to produce output pixel values, said data source iteratively presenting to

said system continuous tone pixel image values associated with each pixel, said system comprising:

A. error means for storing error values associated with a plurality of previously-processed pixels;

B. modification means for connection to said data source and connected to said error means for generating modified pixel values in response to the continuous tone pixel values and weighted error values associated with proximate previously processed pixels, each error value being weighted by a weight comprising a predetermined value dependent on the position of the corresponding previously processed pixel relative to the position of the currently processed pixel, said weight also comprising a relatively small perturbation value which varies from one currently processed pixel to another currently processed pixel;

C. quantization means connected to said modification means for receiving the modified pixel values and for generating, in response thereto, output pixel values; and

D. error generation means connected to said quantization means, said error means and said modification means for generating, in response to the modified pixel values and said output pixel values, an error value for the pixel for storage in said error means.

4,955,066

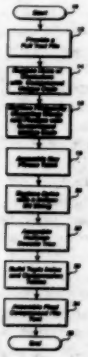
COMPRESSING AND DECOMPRESSING TEXT FILES

Leo A. Notenboom, Woodinville, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Oct. 13, 1989, Ser. No. 421,466

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—56 **12 Claims**



1. A method of compressing a text file stored in a computer memory in digital form, comprising:

generating a full text file having characters formed into phrases, said characters being digitally represented by bytes;

generating a first level compressed text file from said text full file by replacing runs of identical characters with a run flag, the character and a repetition count;

generating a second level compressed text file from said first level compressed text file by replacing frequently occurring phrases in said first level compressed text file with a key phrase flag byte and an index byte; and

generating a third level compressed text file from said second level compressed text file by replacing frequently occurring bytes in said second level compressed text file with a unique string of bits.

4,955,867

RADIATION IMAGE READ-OUT APPARATUS

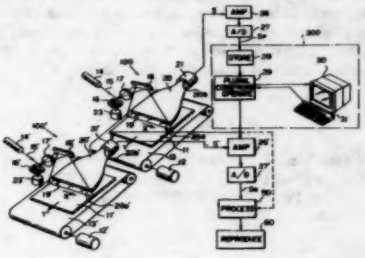
Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 325,275

Claims priority, application Japan, Mar. 18, 1988, 63-64919; Aug. 26, 1988, 63-212231

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—62 **15 Claims**



1. A radiation image read-out apparatus comprising:

(i) a preliminary read-out means for scanning a stimulable phosphor sheet, on which a radiation image has been stored, with a light beam in order to release part of the energy stored during exposure to radiation as light emitted from said stimulable phosphor sheet, detecting the light emitted by said stimulable phosphor sheet, and obtaining a preliminary read-out image signal which approximately represents said radiation image,

(ii) a final read-out means for scanning said stimulable phosphor sheet with a light beam having an energy intensity higher than that of said light beam used in said preliminary read-out means, detecting light emitted by said stimulable phosphor sheet when it is thus scanned, and obtaining a final read-out image signal which represents said radiation image,

(iii) an image processing means for receiving said final read-out image signal and carrying out image processing of said final read-out image signal, and

(iv) a condition adjusting means for receiving said preliminary read-out image signal, adjusting a read-out condition for use in obtaining said final read-out image signal and/or an image processing condition for use in carrying out image processing, said adjustment being effected on the basis of information carried by said preliminary read-out image signal, and feeding said read-out condition into said final read-out means and/or feeding said image processing condition into said image processing means,

wherein said condition adjusting means is constituted of:

(a) a storage section for storing said preliminary read-out image signal,

(b) a plural conditions operating section for reading said preliminary read-out image signal from said storage section, carrying out a plurality of condition adjustment operating processes based on said preliminary read-out image signal in order to calculate a plurality of read-out conditions to be used in obtaining a final read-out image signal and/or a plurality of image processing conditions to be used in carrying out image processing of the final read-out image signal, and carrying out a plurality of image reproduction operating processes based on said preliminary read-out image signal so as to obtain images corresponding to the images each of which would be reproduced if the final read-out image signal were obtained by using each of a plurality of said read-out conditions thus calculated and/or the final read-out image sig-

nal were image processed by using each of a plurality of said image processing conditions thus calculated,

(c) a plural images displaying section which uses each of a plurality of preliminary read-out image signals obtained from said image reproduction operating processes to display each of a plurality of images, and

(d) a designating section for designating one of the plurality of said images displayed at said plural images displaying section,

said plural conditions operating section feeding a read-out condition, which corresponds to said image designated by said designating section, into said final read-out means, and/or feeding an image processing condition, which corresponds to said image designated by said designating section, into said image processing means.

4,955,068

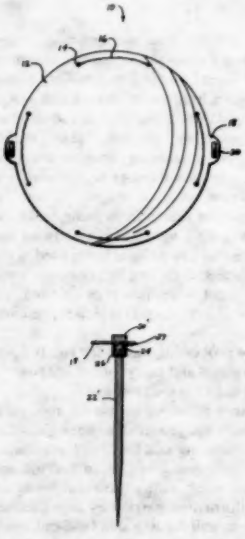
LEAF DISPOSAL BAG

Robert Tenalhan, 18 Timothy Dr., W. Bridgewater, Mass. 02379

Filed Dec. 1, 1988, Ser. No. 278,479

Int. Cl.[5] B65D *30/00*; B65B *3/16*

U.S. Cl. 383—4 **1 Claim**



1. A leaf disposal bag, comprising:

a large diameter circular sheet;

a plurality of apertures spaced around a peripheral edge of said sheet;

a drawstring threaded through said apertures;

a pair of tabs disposed at diametrically opposite locations adjacent the peripheral edge of said circular sheet;

a ground insertion spike received through each of said tabs for retaining said sheet in a flat open condition;

each of said spikes having an enlarged head portion overlying an upper surface of one of said tabs;

each of said spikes having a separable shank portion terminating in a pointed tip adapted for ground insertion;

a frusto conical plug on said enlarged head portion, said plug formed from a resilient material and connected to said enlarged head by a reduced diameter cylindrical stem; and

a mating socket on said separable shank portion, said socket formed from a resilient material and having a radially inwardly extending annular rim dimensioned for engagement with said reduced diameter cylindrical stem.

4,955,069

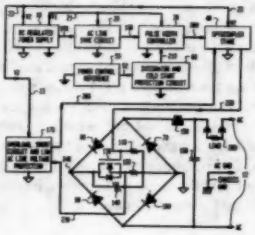
A.C. POWER CONTROLLER WITH SHORT CIRCUIT AND OVERLOAD PROTECTION

Adrian F. Ionescu, 15 Swan River St., Patchogue, N.Y. 11772

Filed Mar. 2, 1989, Ser. No. 317,932

Int. Cl.[5] H02P *5/00*

U.S. Cl. 388—811 **23 Claims**



1. An A.C. solid state power controller for controlling current through a load from an alternating current source connected to said load, comprising:

a rectifier bridge having alternating current input terminals connected to said load and said alternating current source such that said rectifier bridge, said load and said alternating current source are connected to provide a load current path therethrough, said rectifier bridge including direct current output terminals;

solid state switch means connected between said direct current output terminals of said rectifier bridge including a D.C turn on and turn off control gate for turning on and turning off said solid state switch means and permitting current flow therethrough and thereby permitting said current from said alternating current source to flow in said load current path through said load, said solid state switch means being directly turned off by said control gate to thereby prevent said load current path through said rectifier bridge and said load;

gate signal generating means, synchronized to said alternating current source, for providing a gate signal to said control gate for operating said solid state switch means for turn on or turn off thereof; and

circuit protection means, responsive to said current through said load, for providing, independent of the value of line voltage of said alternating current source, a turn off signal to said gate signal generating means whereby said solid state switch means is opened to thereby prevent said load current path through said rectifier bridge and said load and turn off said load current.

4,955,070

APPARATUS AND METHOD FOR AUTOMATICALLY MONITORING BROADCAST BAND LISTENING HABITS

Russell J. Welsh, and John D. Fourdraine, both of Toronto, Canada, assignors to Viewfacts, Inc., Chicago, Ill.

Filed Jun. 29, 1988, Ser. No. 212,909

Int. Cl.[5] H04B *17/00*; H04R *29/00*

U.S. Cl. 455—2 **58 Claims**

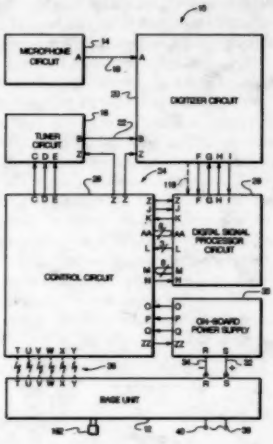
1. A method of automatically monitoring broadcast band listening habits using an electronic monitor and comprising the steps of:

(a) acoustically sensing an audio frequency signal free of an injected identification signal within suitable range of the electronic monitor;

(b) electronically tuning a broadcast band tuner in the elec-

tronic monitor to sense the audio frequency content of an output signal of the tuner;

(c) autocorrelating each of the signals sensed in steps (a) and (b) to obtain a set of correlation coefficients for each signal;



(d) detecting a match between the acoustically sensed signal and the tuner output signal by comparing the sets of correlation coefficients obtained in step (c); and

(e) recording in the electronic monitor the time a match is found.

4,955,071

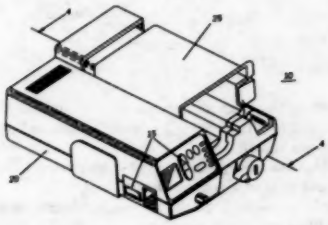
CONVERTER CONSOLE

Soon F. Wong; Chee S. Leong, and Cher Y. Ng, all of Singapore Singapore, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 17, 1989, Ser. No. 339,459

Int. Cl.[5] H04B *1/38*

U.S. Cl. 455—90 **10 Claims**



1. A converter console for converting to mobile operation a portable radio, having externally accessible power contacts and a universal connector for connecting remote controls thereto, said converter console comprising:

a housing including power contacts designed to mate with the power contacts of the portable radio and radio controls connected to a universal connector designed to mate with the universal connector of the portable radio;

a portable radio receiving sleeve having first and second pairs of spaced apart mounting members affixed thereto;

a first pair of guideways formed in said housing including a generally horizontal section and having the first pair of mounting members movably engaged therein for generally horizontal movement;

a second pair of guideways formed in said housing in spaced apart relationship with said first pair of guideways including a generally C shaped section with the bight of the C shaped section being positioned nearest said first pair of guideways and having said second pair of mounting members movably engaged therein for combined horizontal and vertical movement, the C shaped section having a lower end which defines a loaded position for said sleeve wherein the universal connector of a portable radio positioned within said sleeve is mated with the universal connector of said housing and the power contacts of the portable radio are mated with the power contacts of said housing and the C shaped section having an upper end which defines an unloaded position wherein the portable radio is easily removable from said sleeve; and

springs positioned between said housing and said sleeve for biasing said sleeve toward one of the loaded and the unloaded positions.

4,955,072

METHOD OF GENERATING AN AMPLITUDE-MODULATED ISB TRANSMISSION SIGNAL AND APPARATUS FOR CARRYING OUT THE METHOD

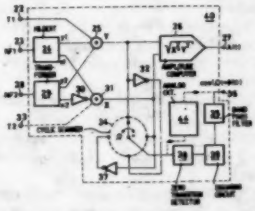
Nenad Tomljenovic, Nussbaumen, Switzerland, assignor to Asea Brown Boveri Ltd, Baden, Switzerland

Filed Aug. 22, 1989, Ser. No. 396,669

Claims priority, application Switzerland, Sep. 15, 1988, 3445/88-4

Int. Cl.[5] H04B *1/68*

U.S. Cl. 455—108 **12 Claims**



1. A method of generating an amplitude-modulated ISB transmission signal with an upper side band and a lower side band, said side bands transmitting independently of each other different information in the form of two different AF signals, comprising the steps:

(a) splitting each of the AF signals into a first and second signal component, said first and second signal components being orthogonal to each other for each AF signal;

(b) forming from the first signal components and the second signal components of the two AF signals, component sums X and Y, wherein in one of the component sums one of the respective signal components is added with inverse operational sign, and wherein in at least one of the component sums a carrier amplitude is added;

(c) calculating from the component sums an amplitude signal A(t) according to the formula

$$A(t)=\sqrt{(X^2+Y^2)};$$

(d) inverting the component sums;

(e) cyclically scanning the component sums and an inverse of each component sum with a subcarrier frequency in one of two orders, X,Y,−X,−Y and X,−Y,−X,Y, thereby producing a scanning signal;

(f) obtaining a phase signal from the scanning signal; and

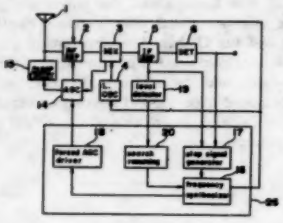
(g) using the amplitude signal in each case for an anode modulation and a grid modulation of a transmitting tube.

4,955,073

AUTOMATIC SEARCH TUNER

Sakae Sugayama, Ohra, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,747
Claims priority, application Japan, Nov. 19, 1987, 62-292429
Int. Cl.[5] H04B 11/16
U.S. Cl. 455—161 6 Claims



1. An automatic search tuner, which includes a radio frequency amplifier for amplifying a received signal, means including a local oscillator circuit and a mixer for generating an intermediate frequency signal upon mixing the output signals of the radio frequency amplifier and the local oscillator circuit, means for amplifying the intermediate frequency signal, a frequency synthesizer for changing the output signal frequency of the local oscillator circuit, and a means for producing a stop signal to stop the changing the output signal frequency of the local oscillator circuit upon occurrence of a received signal of a frequency corresponding to a broadcasting station, comprising:

means for detecting the level of the received signal;

memory means for storing the level of the output signal of the level detecting means upon the occurrence of a stop signal;

means for attenuating the level of the received signal by a predetermined amount;

means for detecting the difference between the level of the attenuated received signal and the signal of the memory means; and

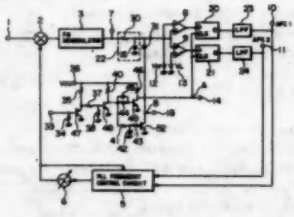
means for resuming an automatic search operation by the frequency synthesizer in response to a predetermined signal output from the detecting means.

4,955,074

APC APPARATUS WITH SELECTION BETWEEN AVERAGE VALUE MODE AND KEYED MODE

Noriaki Omoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 24, 1989, Ser. No. 356,237
Claims priority, application Japan, May 30, 1988, 63-131854; Dec. 6, 1988, 63-307992
Int. Cl.[5] H04B 11/16
U.S. Cl. 455—182 2 Claims



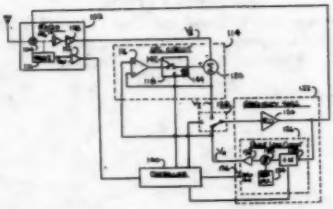
1. An AFC apparatus comprising an FM demodulator, a low-pass filter connected to the output of said demodulator and having a cut-off frequency capable of being switched to control a time constant thereof, a first comparator supplied with a first reference voltage and with an output of said FM demodulator through said low-pass filter for comparison with said first reference voltage, a second comparator supplied with a second reference voltage and with said output of said FM demodulator through said low-pass filter for comparison with said second reference voltage, a first latch circuit for holding a comparison output of said first comparator in response to a key pulse, a second latch circuit for holding a comparison output of said second comparator in response to said key pulse, oscillator means controlled by the outputs of said latch circuits, and a decision circuit for determining the presence or absence of an applied key pulse, said decision circuit controlling the time constant of said low-pass filter by reducing the cut-off frequency of said low-pass filter in the absence of an applied key pulse to smooth an AC component of an output signal of said demodulator, thereby selecting an average value AFC system mode, and increasing the cut-off frequency of said low-pass filter in the presence of an applied key pulse to set a time constant smaller than the key pulse duration, thereby selecting a keyed AFC system mode.

4,955,075

BATTERY SAVER CIRCUIT FOR A FREQUENCY SYNTHESIZER

George C. Anderson, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 17, 1988, Ser. No. 258,935
Int. Cl.[5] H03L 7/00, 7/06
U.S. Cl. 455—182 9 Claims



1. A battery saver circuit, comprising in combination:

a controlled oscillator having a control input and producing an output signal;

selectable frequency lock means for frequency locking said output signal to a control signal;

selectable phase lock means for phase locking said output signal to a reference signal;

control means, switchably coupled to the control input of said controlled oscillator, for selecting one of said frequency lock and phase lock means:

said frequency lock means comprising:

a comparator circuit, a first input of said comparator circuit being coupled to said phase lock means;

a sample and hold circuit, the input of said sample and hold circuit being coupled to the output of said comparator circuit; and

a summing circuit, a first input of said summing circuit being coupled to the output of said sample and hold circuit, a second input of said summing circuit being coupled to said control signal, and the output of said summing circuit being coupled to a second input of said comparator circuit.

4,955,076

LOW NOISE CONVERTER

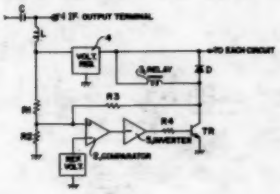
Mitsuhiro Noboru, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 25, 1988, Ser. No. 223,614

Claims priority, application Japan, Jul. 27, 1987, 62-115479[U]

Int. Cl.[5] H04B 1/16, 1/16

U.S. Cl. 455—188 4 Claims



1. In a low noise frequency converter receiving at least two frequency bands from a source of RF signals, a band switching circuit comprising:

means for feeding a power supply voltage of an alternately high and low voltage level to an IF output terminal depending on the frequency band desired to be received;

switch means for switching said frequency bands received from one frequency band to another;

a voltage comparator including a first and second input terminals and an output terminal;

means for coupling said power supply voltage to said first input terminal;

means for supplying a reference voltage to said second input terminal; and

means coupled to said output terminal of said voltage comparator for energizing said switch means with said power supply voltage when said power supply voltage is at said low voltage level thereby changing from one frequency band to another, said switch means being deenergized when said power supply voltage is at said high voltage level for reducing heat generated by said switch means.

4,955,077

RADIO WITH BROAD BAND AUTOMATIC GAIN CONTROL CIRCUIT

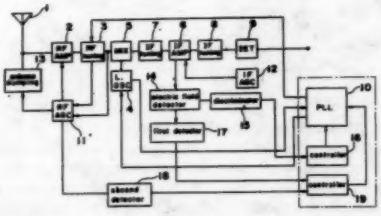
Sakae Sugayama, Ohra, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 10, 1988, Ser. No. 269,904

Claims priority, application Japan, Nov. 16, 1987, 62-288821

Int. Cl.[5] H04B 1/26, 1/10

U.S. Cl. 455—197 6 Claims



1. A radio which includes a radio frequency (RF) amplifier circuit for amplifying received signals and an RF tuning circuit connected with the RF amplifier circuit, comprising:

a broad band automatic gain control circuit for controlling gain of the RF amplifier circuit in response to RF signals which are to be obtained by the RF tuning circuit;

a first detecting means for detecting the intensity of the electric field of the received signals;

a second detecting means for detecting whether or not said band automatic gain control circuit is operating;

means for generating a control signal when signals are simultaneously outputted from the first detecting means and the second detecting means; and

means for changing a tuning frequency of the RF tuning circuit in response to the control signal.

4,955,078

FREQUENCY DIFFERENCE DETECTOR (FDD) HAVING AUTOMATIC GAIN CONTROL AND A CARRIER MODULATED RECEIVER INCLUDING THE FDD

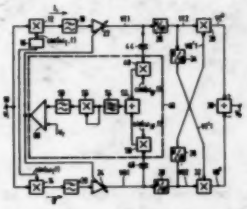
Kah-Seng Chung, Bull Creek, Australia, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1988, Ser. No. 249,635

Claims priority, application United Kingdom, Oct. 5, 1987, 8723313

Int. Cl.[5] H04L 27/14

U.S. Cl. 455—244 19 Claims



1. A frequency difference detector comprising means for producing quadrature related first and second baseband signals, means for selecting in-band signal components in said first and second baseband signals, variable gain amplifying means responsive to an a.g.c. signal for adjusting the amplitude of the in-band signal components, and an a.g.c. system for providing said a.g.c. signal, said a.g.c. system comprising first and second inputs capacitively coupled to signal paths carrying the in-band signal components of the quadrature related first and second signals, first and second quadrature related mixers for frequency up-converting the signals on the first and second inputs, respectively, means for summing said frequency up-converted signals, means for squaring the summed signal and means for deriving an a.g.c. signal from the squared signal and for applying the a.g.c. signal to the variable gain amplifying means.

4,955,079

WAVEGUIDE EXCITED ENHANCEMENT AND INHERENT REJECTION OF INTERFERENCE IN A SUBHARMONIC MIXER

William R. Connerney, Needham, Mass.; Mark E. Raposo, Nashua, N.H.; Winslow G. Round, Merrimack, and Raymond T. Pavio, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1989, Ser. No. 414,340

Int. Cl.[5] H04B 1/26

U.S. Cl. 455—325 9 Claims

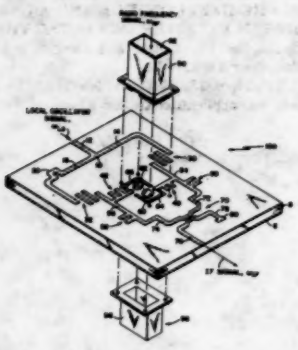
1. In microstrip circuitry wherein a ground plane is formed on one surface of a slab fabricated from a dielectric material and printed circuitry is formed on a second opposing surface of the slab to define signal paths for a local oscillator and for beat frequency signals including desired IF signals, the printed circuitry being disposed to form a heterodyning arrangement

responsive to coupled RF signals and to the LO signal to produce the desired IF signals, such circuitry comprising:

(a) a 3 dB divider having an input port for receiving the LO signal and a first and a second output arm dimensioned to produce a first and a second LO signal with a phase difference of 45° between such signals;

(b) a first pair of diodes, each having an anode and a cathode, connected between the first output arm of the 3 dB divider and the ground plane, the anode of each one of the diodes being connected to the cathode of the other one of the diodes, the first pair of diodes also being optically coupled to RF signals, to produce a first spectrum of IF signals including a first portion of the desired IF signals;

(c) a second pair of diodes, similar to the first pair of diodes,



connected between the second output arm of the 3 dB divider and the ground plane, the second pair of diodes also being optically coupled to RF signals, to produce a second spectrum of IF signals including a second portion of the desired IF signals in quadrature with the first portion of desired IF signals from the first pair of diodes; and

(d) a quadrature hybrid having a first and a second input port and a first and a second output port, said first input port being responsive to the first portion of the desired IF signals from the first pair of diodes and said second input port being responsive to the second portion of the IF signals from the second pair of diodes with said first portion and said second portion of the desired IF signals being substantially in phase at the first output port and substantially 180° out-to-phase at the second output port.

4,955,080

SELECTIVELY CALLED RECEIVER

Kiyoshi Wagai, Hino, and Makoto Murai, Hachioji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1988, Ser. No. 223,983
Claims priority, application Japan, Jul. 29, 1987, 62-189955
Int. Cl.[5] H04B *1/16*
U.S. Cl. 455—343 **6 Claims**

1. A selectively called receiver, comprising:

means for receiving and demodulating a frame signal transmitted through radio communication, the frame signal including call information;

means, enabled in response to a charge control signal, for forming a reference level signal based on an average level of at least a portion of the demodulated frame signal;

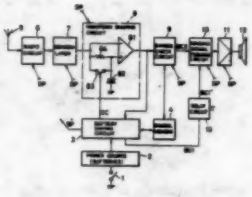
means, responsive to a comparison in level between the reference level signal and the demodulated frame signal, for binarizing and shaping the demodulated frame signal into a shaped pulse signal including the call information;

means, responsive to the shaped pulse signal, for detecting whether the call information indicates the presence of a call to the receiver and for outputting a ringing signal output command if a call to the receiver is detected;

means, enabled in response to the ringing signal output command and a ringing control signal, for generating a predetermined ringing tone;

means, responsive to a turning on of a power source switch, for supplying power to the demodulating means, reference level signal forming means, binarizing and shaping means, detecting means, and ringing tone generating means;

first control means, responsive to the turning on of the



power source switch, for monitoring the power source voltage and for outputting the ringing control signal when the power source voltage is above a predetermined value;

second control means, responsive to the turning on of the power source switch, for outputting the charge control signal; and

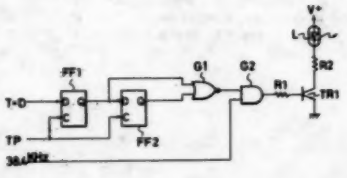
third control means, responsive to a receipt of at least one of the charge control and ringing control signals, for preventing simultaneous enabling of the reference level signal forming means in response to the charge control signal and the ringing tone generating means in response to the ringing control signal.

4,955,081

LIGHT COMMUNICATION SYSTEM

Hiroshi Takahashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 939,309, Dec. 5, 1986, abandoned, which is a continuation of Ser. No. 570,811, Jan. 16, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 240,489
Claims priority, application Japan, Jan. 25, 1983, 58-9376
Int. Cl.[5] H04B *10/04*
U.S. Cl. 455—608 **11 Claims**



1. A communication system comprising:

generating means for generating a signal train that includes an information portion represented by digital pulses;

shortening means connected to said generating means for shortening a width of a digital pulse of the signal train by a predetermined constant width, the width of the shortened pulse corresponding to the width of the digital pulse of the signal train minus the predetermined constant width;

transmission means connected to said shortening means for

transmitting a signal train based on the shortened signal width from said shortening means; and

reception means for receiving the signal train transmitted by said transmission means.

4,955,082

MOBILE COMMUNICATION SYSTEM

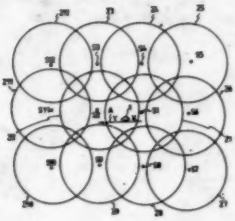
Seiji Hattori; Akihide Kasukawa, both of Tokyo; Yoshizo Shihano, Osaka; Yoshinobu Kobayashi, Osaka, and Shinji Suzuki, Osaka, all of Japan, assignors to The Tokyo Electric Power Company Ltd., Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Jan. 11, 1989, Ser. No. 295,764

Claims priority, application Japan, Jan. 14, 1988, 63-6555

Int. Cl.[5] H04Q 7/00; H04J 3/16

U.S. Cl. 455—33 1 Claim



1. A mobile communication system of the TDMA type for use with a mobile station and a mobile station receiver, comprising:

a plurality of fixed signal transmitting and receiving signposts, each said signpost comprising at least one communicating zone, said zone of each said signpost overlapping a communicating zone of an adjacent signpost;

a signal transmitted from said signposts comprising a frame, said frame including at least one controlling channel, a plurality of voice channels, and at least one positioning channel, said controlling channel and said voice channels comprising a predetermined frequency that is assigned to each said signpost; and

means for setting said positioning channel such that said predetermined frequencies assigned to said signposts are switched every said frame, whereby, said mobile station receiver monitors each said positioning channel, detects a position of said mobile station based on each said positioning channel, and performs a zone switching operation between adjacent signposts based on the detected position of the mobile station.

4,955,083

DUAL MODE RADIO TRANSCEIVER FOR AN SSB COMMUNICATION SYSTEM

Sharon E. T. Phillips, Lake In The Hills, and Bruce C. Eastmond, Downers Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 926,285, Oct. 10, 1986, abandoned. This application Nov. 13, 1989, Ser. No. 434,562

Int. Cl.[5] H04B 1/68, 1/02

U.S. Cl. 455—47 40 Claims

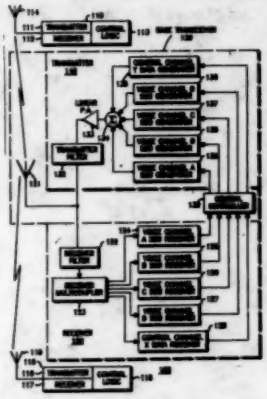
1. A dual-mode remote radio station for use in a radio communication system, having a primary station and at least one remote station, said primary and remote stations capable of operating on a plurality of radio frequency channels, said remote station comprising:

a receiver means for receiving signals including:

means for selectively receiving one of either:

(a) voice messages transmitted on a first type of modulation within a first channel of said plurality of channels, said first channel having a predetermined channel bandwidth; or

(b) a first set of data messages carrying information from said primary station to said remote stations identifying said first channel of said plurality of channels, said first set of data messages transmitted continuously by a second type of modulation within a second channel of said plurality of



channels, said second channel having a predetermined channel bandwidth being no wider than said first channel bandwidth; and

control means for automatically controlling said receiver means such that said voice messages are received from said first channel in response to information derived from said first set of data messages received from said second channel.

4,955,084

PAGING RECEIVER WITH METALLIC DISPLAY FRAME STRUCTURE INCREASING ANTENNA GAIN

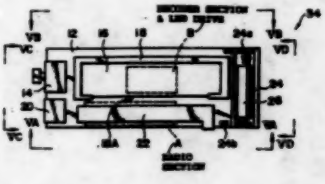
Shiajiro Umetsu, and Toshihiro Mori, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Mar. 2, 1989, Ser. No. 317,748

Claims priority, application Japan, Mar. 4, 1988, 63-52175

Int. Cl.[5] H04B 1/08, 1/10

U.S. Cl. 455—278 4 Claims



1. A receiver comprising:

a loop antenna;

a plurality of elements for processing a signal received by said antenna; and

a metallic member for structurally supporting at least one of said elements, said metallic member having a generally-rectilinear portion located generally in parallel with a longitudinal axis of said loop antenna;

said metallic member further having a portion adjacent to said loop antenna, said adjacent portion including a gap of

sufficient size to substantially prevent loss of gain of said antenna resulting from mirror current in said metallic member induced by current in said antenna.

4,955,085

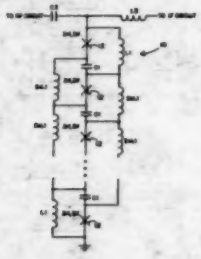
SERIES RF/PARALLEL IF MIXER ARRAY

David P. Woody, Bishop, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 7, 1988, Ser. No. 164,933

Int. Cl.[5] H04B *1/26*

U.S. Cl. 455—330 **14 Claims**



1. A mixer circuit for use in a heterodyne receiver for converting a radio frequency (RF) signal to an intermediate frequency (IF) signal, the circuit having a plurality of mixing elements each having an impedance Zif which is higher at the IF frequency than its impedance Zrf is at the RF frequency; the circuit comprising;

a series interconnection of said elements;

a plurality of capacitors connected in said series interconnection, at least one such capacitor connected serially between each pair of said elements;

a plurality of inductors, at least one such inductor connected in parallel with each combination of element and adjacent capacitor;

said capacitor being selected to substantially block signals at the IF frequency and pass signals at the RF frequency and said inductors being selected to substantially block signals at the RF frequency and pass signals at the IF frequency, whereby said elements are connected in series at the RF frequency and are connected in parallel at the IF frequency and the net impedance of the circuit at said IF frequency is Zif divided by the number of said mixing elements and the net impedance of the circuit at said RF frequency is Zrf multiplied by the number of said mixing elements.

4,955,086

REFLECTION TRANSMITTER AND RECEIVER MEANS FOR A BIDIRECTIONAL LIGHT WAVEGUIDE COMMUNICATIONS SYSTEM

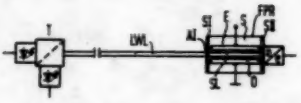
Stefan Kindt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,728

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742504

Int. Cl.[5] H04B *10/24*

U.S. Cl. 455—605 **4 Claims**



1. In a reflection transmitter and receiver means for a bidirectional light waveguide communications system comprising a light waveguide having a first and second end, a light source preferably formed by a laser at only the first end of said light waveguide, and an electro-optical transducer being coupled to the second end to receive light leaving said second end, the improvement comprising an electrically controllable integrated-optical Fabry-Perot resonator having first and second partially reflecting mirrors and control electrodes, said resonator being connected to the second end of the waveguide with the first partially reflecting mirror forming an input/output for the waveguide, said electrodes being connected to a transmission signal source and said transducer being positioned to receive light passing through the second partial reflective mirror.

DESIGN PATENTS

GRANTED SEP. 4, 1990

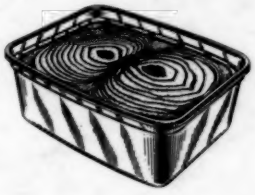
ERRATA

For CLASS	See PATENT NO.
D02-029	310,286
D99-017	310,286

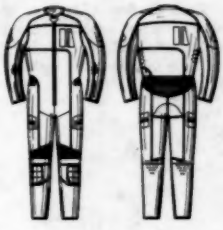
DESIGNS

SEPTEMBER 4, 1990

310,285
COMBINED FROZEN CONFECTION AND CONTAINER
Kevin P. Hillman, Cheltenham, and Ian Butcher, Guildford, both of Great Britain, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.
Filed Oct. 21, 1987, Ser. No. 112,142
Claims priority, application United Kingdom, Apr. 21, 1987, 1041672
Term of patent 14 years
U.S. Cl. D1—102



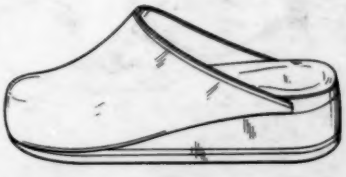
310,286
COVERALL FOR MOTORCYCLISTS OR THE LIKE
Hisashi Kushitani, No.9-14,4-chome, Yoga,Setagaya-Ku, Tokyo, Japan
Filed Dec. 21, 1987, Ser. No. 135,622
Term of patent 14 years
U.S. Cl. D2—29



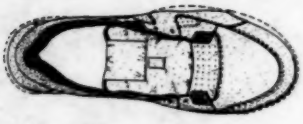
310,287
FETTUCINI
Joseph P. Pellegrino, North Andover, Mass. 01845, assignor to The Prince Company, Inc., Columbus, Ohio
Filed May 1, 1987, Ser. No. 45,050
Term of patent 14 years
U.S. Cl. D1—126

310,288
NURSING GARMENT
Rebecca L. Larsch, 5099 W. Seven ile Rd., Northville, Mich. 48167
Filed Nov. 25, 1988, Ser. No. 275,800
Term of patent 14 years
U.S. Cl. D2—211

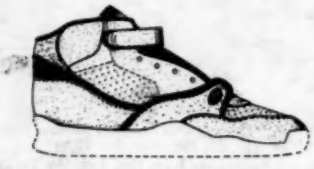
310,289
SLIP-ON SHOE
Piero Farina, Via Privata Letizia 6, 20144 Milano, Italy
Filed Apr. 23, 1987, Ser. No. 41,757
Claims priority, application Italy, Oct. 29, 1986, 23520/86[U]
Term of patent 14 years
U.S. Cl. D2—283



310,290
SHOE UPPER
Judith Ringel, Milton, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 23, 1989, Ser. No. 370,016
Term of patent 14 years
U.S. Cl. D2—314



310,291
SHOE UPPER
Lawrence Selbiger, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Jun. 22, 1989, Ser. No. 370,298
Term of patent 14 years
U.S. Cl. D2—314



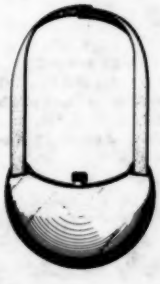
310,292
SHOE UPPER
Lawrence Selbiger, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Jun. 22, 1989, Ser. No. 370,303
Term of patent 14 years
U.S. Cl. D2—314

310,293
SHOE UPPER
Ralph Serna, and Paul D. Brown, both of Hingham, Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 26, 1989, Ser. No. 371,025
Term of patent 14 years
U.S. Cl. D2—314

310,294
GOLF SHOE BOTTOM
William R. Peterson, Braintree, Mass., assignor to Tretorn AB, Ronnowsgaton, Sweden
Filed Dec. 30, 1987, Ser. No. 139,714
Term of patent 14 years
U.S. Cl. D2—317

310,295
SHOE SOLE
Pamela B. Boucher, Brighton, and Paul D. Brown, Hingham, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 23, 1989, Ser. No. 373,071
Term of patent 14 years
U.S. Cl. D2—320

310,296
PORTABLE DRINK CONTAINER
Ronald E. Janus, Oak Lawn, Ill., assignor to JI-SCO-NI Enterprises, Inc., Chicago, Ill.
Filed Oct. 3, 1986, Ser. No. 915,334
Term of patent 14 years
U.S. Cl. D3—301

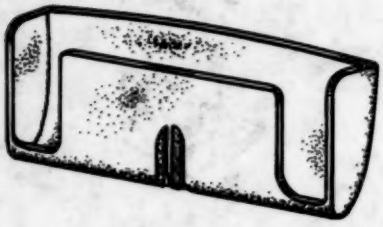


310,297
PARTITION FOR A CAMERA BAG
George L. Howitt, River Edge, N.J., assignor to Charles Beseler Company, Florham Park, N.J.
Filed Jan. 28, 1987, Ser. No. 7,917
Term of patent 14 years
U.S. Cl. D3—33

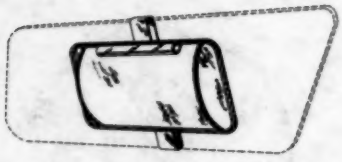
310,298
CAMERA CASE
Hiroyuki Fukushima, Hoya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1987, Ser. No. 69,578
Claims priority, application Japan, Jan. 7, 1987, 62-326
Term of patent 14 years
U.S. Cl. D3—33

310,299
CAMERA CASE
Hitomi Ito, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1988, Ser. No. 201,461
Claims priority, application Japan, Dec. 7, 1987, 62-50226
Term of patent 14 years
U.S. Cl. D3—33

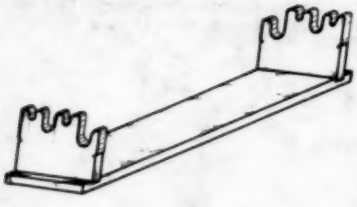
310,300
REINFORCING INSERT FOR A SPECTACLE CASE
Robert J. Marks, Las Vegas, Nev., and William L. Eakes, San Jose, Calif., assignors to California Optical Leather, Inc., San Leandro, Calif.
Filed Dec. 14, 1987, Ser. No. 132,855
Term of patent 14 years
U.S. Cl. D3—34



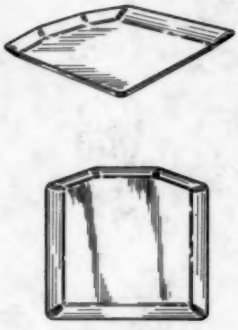
310,301
EYEGLASS HOLDER
Tommy J. Burrow, 1021 NE. JIB Court, Unit C, P.O. Box 549, Lee's Summit, Mo. 64064
Filed Aug. 17, 1988, Ser. No. 233,140
Term of patent 14 years
U.S. Cl. D3—34



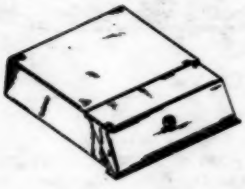
310,302
GUN SUPPORT CRADLE
Robert C. Southard, Box 94, Locust Grove, Ark. 72550
Filed Aug. 21, 1987, Ser. No. 87,755
Term of patent 14 years
U.S. Cl. D3—38



310,303
CAR SEAT TRAY
Peter Colletti, 510 Maple, Prospect Heights, Ill.
Filed Dec. 24, 1986, Ser. No. 946,299
Term of patent 14 years
U.S. Cl. D3—40

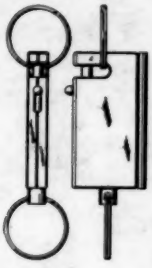


310,304
SECURITY BOX FOR VEHICLES AND THE LIKE
William H. Carmichael, 1944 S. Kearney Way, Denver, Colo. 80224
Continuation-in-part of Ser. No. 78,881, Jul. 28, 1987, which is a continuation-in-part of Ser. No. 36,966, Apr. 10, 1987. This application Jan. 5, 1988, Ser. No. 140,814
Term of patent 14 years
U.S. Cl. D3—40

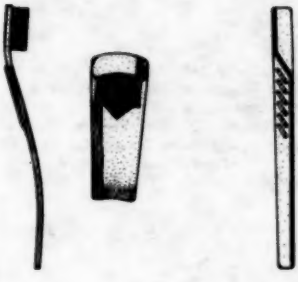


310,305
KEY RING
Frank Scognamillo, 2331 Oak Hill Dr., Lisle, Ill. 60532, and Jay C. Covington, 1203 Lisle Pl., both of Lisle, Ill. 60532
Filed Oct. 23, 1986, Ser. No. 922,545
Term of patent 14 years
U.S. Cl. D3—61

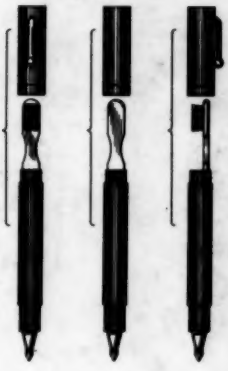
310,306
KEY HOLDER
Sumner B. MacDonald, 39 Sea Breeze La., Bristol, R.I. 02809
Filed Sep. 12, 1988, Ser. No. 243,023
Term of patent 14 years
U.S. Cl. D3—61



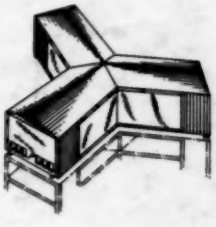
310,307
TOOTHBRUSH
Carlos J. Moglianesi, Whittier, Calif.; Mark Falco, Lavallette, and Leslie Peoples, Trenton, both of N.J., assignors to Contour, Inc., Trenton, N.J.
Filed Jan. 4, 1988, Ser. No. 140,424
Term of patent 14 years
U.S. Cl. D4—104



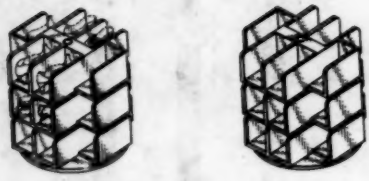
310,308
COMBINED TOOTHBRUSH AND PEN
Paul Wolsey, Box 132, Stirling, Alberta, Canada T0K 2E0
Filed Mar. 7, 1988, Ser. No. 164,650
Term of patent 14 years
U.S. Cl. D4—108



310,309
HEADER FOR A MERCHANDISING DISPLAY STAND OR THE LIKE
William Prendergast, Park Ridge, N.J., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Dec. 5, 1986, Ser. No. 938,781
The portion of the term of this patent subsequent to Jul. 31, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—455

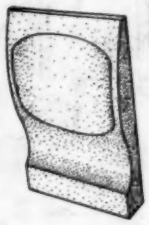


310,310
SHOE CAROUSEL
Larry J. Martinez, 3714 S. 4565 W., West Valley, Utah 84120
Filed May 5, 1987, Ser. No. 46,304
Term of patent 14 years
U.S. Cl. D6—457

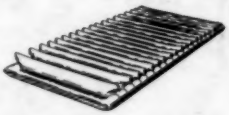


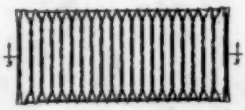
310,311
SUNSHADE ATTACHMENT FOR A CHAIR OR SIMILAR ARTICLE
Melody A. Bergen, and David A. Bergen, both of 14101 La Mesa Ct., Tampa, Fla. 33625
Filed May 7, 1987, Ser. No. 47,253
Term of patent 14 years
U.S. Cl. D6—500

310,312
BACK SUPPORT CUSHION
Richard G. Wong, 807 Fourth St., Santa Rosa, Calif. 95401, and Donald V. Pabros, 503 Buena Vista Dr., Santa Rosa, Calif. 95404
Filed Jun. 6, 1988, Ser. No. 202,434
Term of patent 14 years
U.S. Cl. D6—596



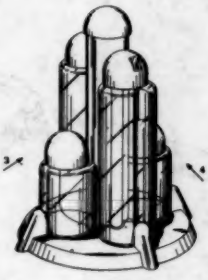
310,313
AIR MATTRESS
Levon Afeyan, Hampstead, Canada, assignor to Afeyan Industries Inc., Montreal, Canada
Filed Nov. 10, 1988, Ser. No. 269,559
Claims priority, application Canada, Sep. 15, 1988, 15-09-88-1
Term of patent 14 years
U.S. Cl. D6—604



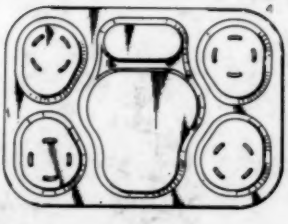


310,314
CAR SEAT COVER
Richard J. Caron, 1570 Madruga Ave., Penthouse 6, Coral Gables, Fla. 33146
Filed Sep. 8, 1987, Ser. No. 93,981
Term of patent 14 years
U.S. Cl. D6—611

310,316
CONDIMENT SET
Ambrogio Rossari, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Aug. 3, 1987, Ser. No. 81,281
Claims priority, application Italy, Feb. 4, 1987, 20732/87[U]
Term of patent 14 years
U.S. Cl. D7—590



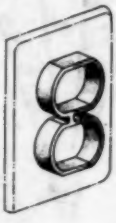
310,315
FOOD SERVICE TRAY
Vincent J. Bitel, Rockfall, Conn., assignor to The Rogers Manufacturing Company, Rockfall, Conn.
Filed Dec. 29, 1987, Ser. No. 139,271
Term of patent 14 years
U.S. Cl. D7—554



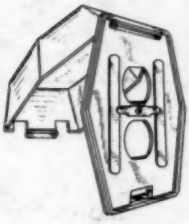
310,317
THREE COMPARTMENT PASTRY BAG
James M. Broderick, 4618 S. Cayuse Rd., Rapid City, S. Dak. 57702, and E. Leonard Lewis, Pouch 340065, Prudhoe Bay, Ak. 99734
Filed Jan. 14, 1988, Ser. No. 143,685
Term of patent 14 years
U.S. Cl. D7—700

310,318
HAND SAW
Sture Backman, Bollnas, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden
Filed Apr. 26, 1988, Ser. No. 186,214
Claims priority, application Sweden, Oct. 26, 1987, 87-2431
Term of patent 14 years
U.S. Cl. D8—95

310,319
WALL OUTLET GUARD
Larry W. Brookman, 1380 Farrington Rd., Philadelphia, Pa. 19151
Filed Dec. 12, 1986, Ser. No. 941,263
Term of patent 14 years
U.S. Cl. D8—350

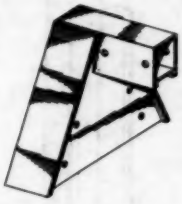


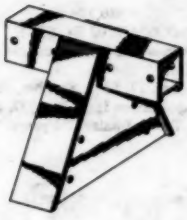
310,320
PROTECTIVE COVER FOR ELECTRICAL OUTLET
Anthony F. Domian, 1222 Old Concord Rd., Monroeville, Pa. 15146
Continuation of Ser. No. 45,662, May 1, 1987, abandoned. This application Jun. 29, 1987, Ser. No. 67,091
Term of patent 14 years
U.S. Cl. D8—350



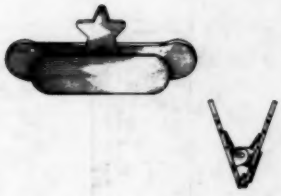
310,321
GASOLINE PUMP NOZZLE HANDLE HOLDER
Broc Glover, 1219 S. Athena Way, #3, Anaheim, Calif. 92806
Filed Nov. 10, 1988, Ser. No. 269,979
Term of patent 14 years
U.S. Cl. D8—354

310,322
SUPPORT FOR A FRAME OF AN OUTDOOR PLAY DEVICE OR THE LIKE
Joseph A. Powell, Uniontown, Ohio, assignor to Rainbow Fabrications, Incorporated, Uniontown, Ohio
Filed Jun. 22, 1987, Ser. No. 64,799
Term of patent 14 years
U.S. Cl. D8—382



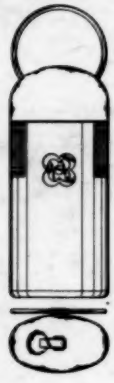


310,323
SPRING CLIP
Jerrilyn C. Kiyokane, Seal Beach, Calif., assignor to Nankang Promotions, Inc., Costa Mesa, Calif.
Filed Nov. 7, 1988, Ser. No. 267,770
Term of patent 14 years
U.S. Cl. D8—395



310,324
ROOF FASTENING PLATE
Peter J. Bernacchi, LaPorte, Ind., and Larry G. Barrett, Niles, Mich., assignors to Insul-Mark, Midwest, Inc., LaPorte, Ind.
Filed Mar. 2, 1987, Ser. No. 20,683
Term of patent 14 years
U.S. Cl. D8—399

310,325
CONTAINER
Luciano Moglia, Borgaro Torinese, Italy, assignor to Viset S.p.A., Milan, Italy
Filed Apr. 22, 1987, Ser. No. 43,680
Term of patent 14 years
U.S. Cl. D9—336



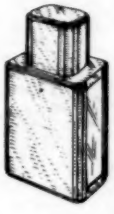
310,326
COMBINED CONTAINER AND DRINKING STRAW
Edgar O. Carlsen, 5681 Bayshore Rd. N., Ft. Myers, Fla. 33917
Filed Dec. 7, 1987, Ser. No. 130,331
Term of patent 14 years
U.S. Cl. D9—337

310,327
POP CAN STORAGE DEVICE
Richard A. Rinke, 737 Charlesina St., Rochester, Mich. 48064
Filed Feb. 22, 1988, Ser. No. 158,167
Term of patent 14 years
U.S. Cl. D9—341

310,328
COSMETIC BOTTLE
Pierre Dinand, Levallois Perret, France, assignor to Euroltalia S.R.L., Monza, Italy
Filed Mar. 27, 1987, Ser. No. 32,083
Claims priority, application Italy, Nov. 27, 1986, 23863/86[U]
Term of patent 14 years
U.S. Cl. D9—385

310,329
BOTTLE WITH CAP
Peter Schmidt, Hamburg, Fed. Rep. of Germany, assignor to Margaret Aston AG, Mainz-Rhein, Fed. Rep. of Germany
Filed Aug. 10, 1988, Ser. No. 230,561
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 5612
Term of patent 14 years
U.S. Cl. D9—409

310,330
FRAGRANCE BOTTLE
Oleg L. Cassini, New York, N.Y., assignor to Oleg Cassini, Inc., New York, N.Y.
Filed Apr. 22, 1987, Ser. No. 41,317
Term of patent 14 years
U.S. Cl. D9—410



310,331
COMBINED WATCH AND BAND
Michel P. Ratajski, Bienne, Switzerland, assignor to Severin Montres AG, Zug, Switzerland
Filed Apr. 27, 1987, Ser. No. 43,238
Claims priority, application Int'l Pat. Institute, Oct. 31, 1986, DMA/000547
Term of patent 14 years
U.S. Cl. D10—32

310,332
COMBINED WATCH AND STRAP
Pik L. Wong, Kowloon, Hong Kong, assignor to Justen International (H.K.) Co., Hong Kong, Hong Kong
Filed Apr. 6, 1987, Ser. No. 35,142
Claims priority, application United Kingdom, Oct. 13, 1986, 1037351
Term of patent 14 years
U.S. Cl. D10—32

310,333
WATCH
Wa N. Fong, Hong Kong, Hong Kong, assignor to DesignTime Company Limited, North Point, Hong Kong
Filed Jun. 3, 1987, Ser. No. 56,976
Term of patent 14 years
U.S. Cl. D10—32

310,334
WRISTWATCH
Shapour Jahan, Geneva, Switzerland, assignor to Suter S.A., Geneva, Switzerland
Filed Jun. 2, 1987, Ser. No. 57,437
Claims priority, application Int'l Pat. Institute, Dec. 2, 1986, DMA/000556
Term of patent 14 years
U.S. Cl. D10—32

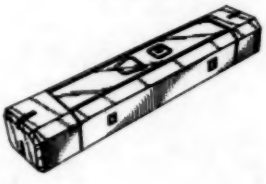
310,335
COMBINED WRISTWATCH AND BRACELET
Severin S. Wunderman, Laguna Beach, Calif., assignor to Severin Montres AG, Zug, Switzerland
Filed Jun. 4, 1987, Ser. No. 57,950
Term of patent 14 years
U.S. Cl. D10—32

310,336
COMBINED WRISTWATCH AND BRACELET
Severin S. Wunderman, Laguna Beach, Calif., assignor to Severin Montres AG, Zug, Switzerland
Filed Jun. 4, 1987, Ser. No. 57,976
Claims priority, application Int'l Pat. Institute, Dec. 8, 1986, DMA/000559
Term of patent 14 years
U.S. Cl. D10—32

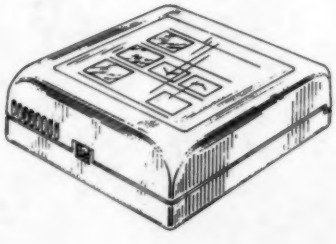
310,337
WRIST WATCH AND BAND
Michel P. Ratajski, Bienne, Switzerland, assignor to Severin Montres AG, Zug, Switzerland
Filed Apr. 27, 1987, Ser. No. 43,239
Claims priority, application Int'l Pat. Institute, Apr. 30, 1987, DMA/000547
Term of patent 14 years
U.S. Cl. D10—39

310,338
TIMER MECHANISM FOR A WILDLIFE FEEDER MOTOR
Earl E. Cureton, 358 Fenwick Dr., San Antonio, Tex. 78239
Filed Jan. 14, 1987, Ser. No. 3,185
Term of patent 14 years
U.S. Cl. D10—40

310,339
POINT LOCATION DEVICE
S. David Tofte, Mankato, and Jeffry M. Irish, Nicolet, both of Minn., assignors to Micro-Trak Systems, Inc., Mankato, Minn.
Filed Apr. 8, 1988, Ser. No. 179,140
Term of patent 14 years
U.S. Cl. D10—46

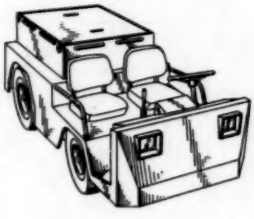


310,340
LOCAL ROOM THERMOSTAT
Seiji Wada; Nobuo Otsuka, both of Kamakura; Toyohiro Kobayashi, Shizuoka, all of Japan, and Peter Thompson, Cypress, Calif., assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1987, Ser. No. 98,681
Term of patent 14 years
U.S. Cl. D10—50

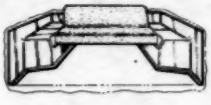


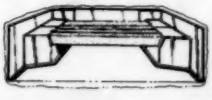
310,341
TAPE MEASURE
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan
Filed Apr. 16, 1987, Ser. No. 39,595
Claims priority, application Japan, Oct. 18, 1986, 61-41133
Term of patent 14 years
U.S. Cl. D10—71

310,342
TOW TRACTOR
Joaquin F. Formoso, Madrid, Spain, assignor to FMC Corporation, Chicago, Ill.
Filed Jun. 8, 1987, Ser. No. 59,684
Term of patent 14 years
U.S. Cl. D12—14



310,343
COMBINATION TRUCK BED LINER AND CONVERTIBLE CUSHION UNIT
Michael Angerer, 26666 Rosehill, Farmington Hills, Mich. 48018
Filed Feb. 26, 1987, Ser. No. 19,343
Term of patent 14 years
U.S. Cl. D12—98





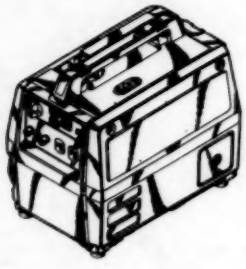
310,344
VEHICLE TIRE
Masami Shinomiya, Osaka, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Dec. 22, 1987, Ser. No. 137,318
Claims priority, application Japan, Jul. 2, 1987, 62-27098
Term of patent 14 years
U.S. Cl. D12—148

310,345
AUTOMOBILE FENDER SPOILER GUARD
Pierre Charet; Duke Krasi, both of Miami, Fla., assignor to Rally Manufacturing Inc., Miami, Fla.
Filed Jan. 6, 1988, Ser. No. 141,342
Term of patent 14 years
U.S. Cl. D12—185

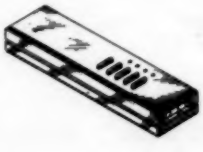
310,346
LENSE COVER FOR INSERTION IN THE RECESSED AREAS OF THE DASHBOARD INSTRUMENT PANEL FOR PREVENTION OF DUST AND DIRT BUILDUP
Darrin D. Allred, Star Rte. #2, Box 67, Altonah, Utah 84002
Filed Jul. 31, 1987, Ser. No. 79,902
Term of patent 14 years
U.S. Cl. D12—192

310,347
LICENSE PLATE FRAME
Paul Spencer, 2908 Oregon Ct., Ste. I-1, Torrance, Calif. 90503
Filed Feb. 16, 1988, Ser. No. 156,087
Term of patent 14 years
U.S. Cl. D12—193

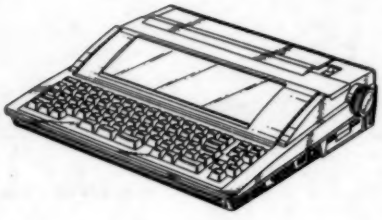
310,348
ENGINE GENERATOR
Masaaki Higuchi, Koshigaya; Masaru Atsuumi, Saitama; Yasuo Otake, Ohmiya, and Yukinori Itoh, Kawagoe, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 20, 1987, Ser. No. 110,682
Claims priority, application Japan, Apr. 22, 1987, 62-015977
The portion of the term of this patent subsequent to Jul. 31, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—114



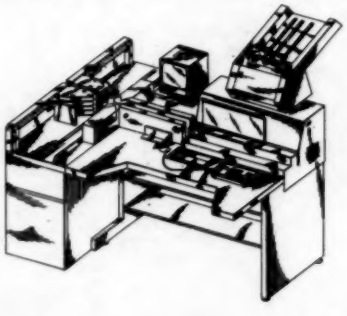
310,349
WIRELESS TRANSMITTER FOR SELECTABLE LIGHT LEVEL CONTROL SWITCH
Michael J. Rowen, Center Valley, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Sep. 26, 1988, Ser. No. 249,465
Term of patent 14 years
U.S. Cl. D13—168



310,350
COMBINED WORD PROCESSOR AND COMPUTER
Hideyuki Horie, Chiba; Masahiko Tabuchi, and Yoshihiko Sugano, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 10, 1987, Ser. No. 131,387
Claims priority, application Japan, Jul. 6, 1987, 62-27197
Term of patent 14 years
U.S. Cl. D14—100



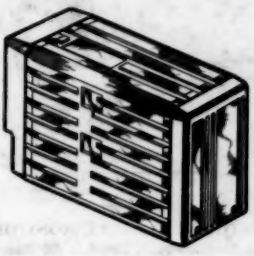
310,351
CHARACTER INDICIA ENCODING DESK FOR MAIL
Charles E. Bain, West Dundee, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Apr. 30, 1987, Ser. No. 44,459
Term of patent 14 years
U.S. Cl. D14—103



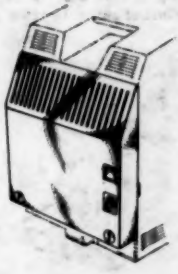
310,352
COMBINED DATA INPUT/OUTPUT TERMINAL AND CARD READER
Shuzo Kato; Yasushi Nakamura, both of Hiratsuka, and Junnosuke Takeda, Ninomiya, all of Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 25, 1987, Ser. No. 101,349
Claims priority, application Japan, Mar. 30, 1987, 62-11678
Term of patent 14 years
U.S. Cl. D14—105

310,353
ELECTRONIC COMPUTER
Yoshihiko Sugano, and Masahiko Tabuchi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 10, 1987, Ser. No. 131,388
Claims priority, application Japan, Jun. 17, 1987, 62-24428
Term of patent 14 years
U.S. Cl. D14—106

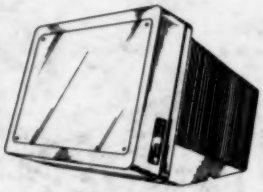
310,354
HARD DISK DRIVE MODULE
David P. Moriconi, Ben Lomond, and Andrew G. Austin, Santa Cruz, both of Calif., assignors to Tandon Corporation, Moorpark, Calif.
Filed Feb. 26, 1987, Ser. No. 19,551
Term of patent 14 years
U.S. Cl. D14—109



310,355
HARD DISK DRIVE FOR MOUNTING ON THE REAR OF A COMPUTER
Dennis Trager, 542 Marine World Pkwy. #4203, Redwood City, Calif. 94065
Filed Aug. 3, 1987, Ser. No. 980,689
Term of patent 14 years
U.S. Cl. D14—109

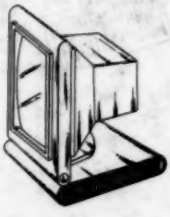


310,356
VIDEO MONITOR
Peter B. Barron, Leominster, Mass.; Allan Weaver, and Margaret A. Maas, both of Hollis, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Feb. 25, 1988, Ser. No. 160,492
Term of patent 14 years
U.S. Cl. D14—113

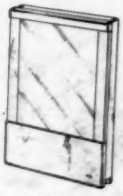


310,357
CATHODE RAY TUBE MONITOR
Paul E. Brefka, Southborough; David L. Adriaansen, Arlington, and Steven E. Greystone, Boston, all of Mass., assignors to Computer Sports Systems, Inc., Cambridge, Mass.
Filed Jul. 28, 1988, Ser. No. 225,508
Term of patent 14 years
U.S. Cl. D14—113

310,358
COMBINED MONITOR AND PROCESSOR FOR COMPUTER WORK STATION OR SIMILAR ARTICLE
Michael J. Nuttall, Palo Alto, and Nelson S. Au, Foster City, both of Calif., assignors to Bell & Howell Publication Systems Company, Skokie, Ill.
Filed Sep. 7, 1988, Ser. No. 241,547
Term of patent 14 years
U.S. Cl. D14—113

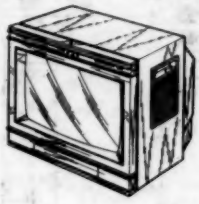


310,359
IMAGE DISPLAY TERMINAL
Yoshinori Inukai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 21, 1988, Ser. No. 260,489
Claims priority, application Japan, Apr. 25, 1988, 63-17021
Term of patent 14 years
U.S. Cl. D14—113



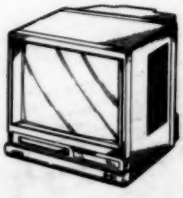
310,360
TELEVISION SET
Ryunosuke Kitagawa, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 6, 1987, Ser. No. 12,218
Claims priority, application Japan, Aug. 8, 1986, 61-31272
Term of patent 14 years
U.S. Cl. D14—126

310,361
TELEVISION RECEIVER
Tae B. Kim, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Oct. 14, 1987, Ser. No. 108,805
Claims priority, application Rep. of Korea, Jun. 10, 1987, 87-8733
Term of patent 14 years
U.S. Cl. D14—126

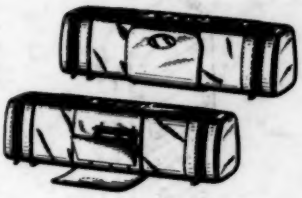


310,362
PORTABLE TELEVISION RECEIVER/MONITOR
Matthew Davis, Vandalia, Ohio, assignor to North American Philips Corp., New York, N.Y.
Filed Oct. 13, 1988, Ser. No. 257,233
Term of patent 14 years
U.S. Cl. D14—126

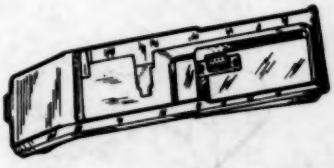
310,363
COMBINED TELEVISION AND VIDEO RECORDER
Kue S. Shim, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 24, 1988, Ser. No. 159,704
Claims priority, application Rep. of Korea, Sep. 16, 1987, 14066
Term of patent 14 years
U.S. Cl. D14—129



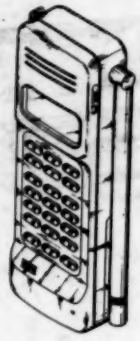
310,364
COMBINED CASSETTE TAPE RECORDER AND RADIO RECEIVER
Toshiyuki Matuso, Kawasaki, and Kazue Katob, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 17, 1987, Ser. No. 134,454
Claims priority, application Japan, Sep. 30, 1987, 62-40051
Term of patent 14 years
U.S. Cl. D14—163



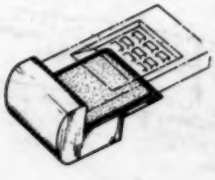
310,365
COMBINATION HANDSET TELEPHONE AND STAND
Gunder W. Eriksson, Taby, and Kjell Nordenskjold, Lidingo, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Feb. 29, 1988, Ser. No. 162,360
Claims priority, application Sweden, Aug. 28, 1987, 87-1887
Term of patent 14 years
U.S. Cl. D14—138



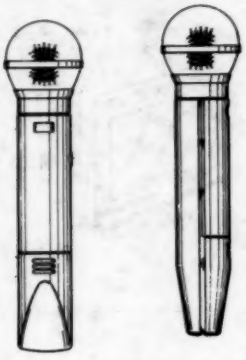
310,366
PORTABLE RADIO TELEPHONE
Kazuo Akaike; Masahiko Kobayashi, both of Hamura; Osamu Utsunomiya, Hino; Ryuichi Takahashi, Akishima, and Tetsufumi Takayasu, Chofu, all of Japan, assignors to Koknsai Electric Co., Ltd., Tokyo, Japan
Filed Jun. 21, 1989, Ser. No. 369,666
Claims priority, application Japan, Dec. 27, 1988, 63-51080
Term of patent 14 years
U.S. Cl. D14—138



310,367
REMOTE CONTROL ADAPTER
Devan Dockery, Rte. 8, Box 14, DeFuniak Springs, Fla. 32433
Filed Jul. 29, 1988, Ser. No. 225,941
Term of patent 14 years
U.S. Cl. D14—217

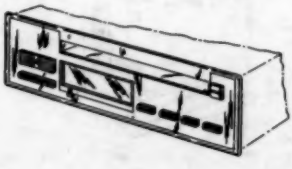


310,368
WIRELESS MICROPHONE
Robert L. Derhaag, San Marcos, and Donald A. Kutz, Del Mar, both of Calif., assignors to H.M. Electronics, Inc., San Diego, Calif.
Filed Mar. 27, 1987, Ser. No. 31,682
Term of patent 14 years
U.S. Cl. D14—228

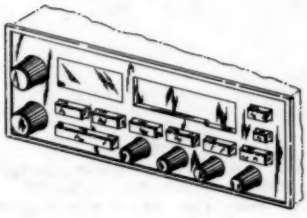


310,369
FRONT PANEL FOR A GRAPHIC EQUALIZER OR SIMILAR ARTICLE
David F. Kolenda, Livonia, and Thomas J. Kane, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed May 18, 1987, Ser. No. 51,115
Term of patent 14 years
U.S. Cl. D14—258

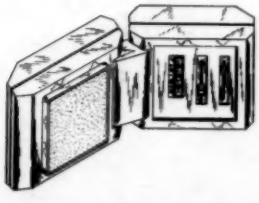
310,370
FRONT PANEL FOR A COMPACT DISC PLAYER
Carol M. Repasky, Ypsilanti, and Mark A. Dobies, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 28, 1987, Ser. No. 138,522
Term of patent 14 years
U.S. Cl. D14—258



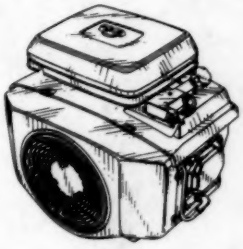
310,371
FRONT CONTROL PANEL FOR A COMBINED VEHICULAR CASSETTE PLAYER AND RADIO RECEIVER
Robert P. Scott, Dearborn, and Kenneth H. Bloom, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 28, 1987, Ser. No. 138,523
Term of patent 14 years
U.S. Cl. D14—258



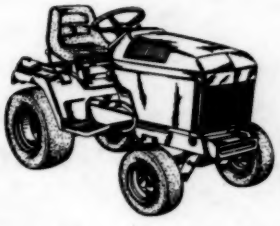
310,372
PORTABLE ENVIRONMENTAL SOUND MACHINE
Mark S. Kimbrough, Wichita, Kans., and Craig S. Potter, Wake Forest, N.C., assignors to Marpac Corporation, Wilmington, N.C.
Filed May 20, 1987, Ser. No. 52,562
Term of patent 14 years
U.S. Cl. D14—299



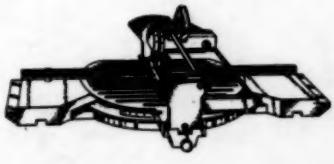
310,373
ENGINE
Keisuke Ishii; Hitoshi Taguchi, and Kiyohide Sumi, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 7, 1988, Ser. No. 256,010
Claims priority, application Japan, Apr. 9, 1988, 63-014326
Term of patent 14 years
U.S. Cl. D15—1



310,374
TRACTOR FOR LAWNS, GARDENS, OR THE LIKE
David A. Westimayer, Horicon, Wis.; William E. Crookes, Waldwick, N.J., and Daniel R. Nickles, Monroe, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Mar. 31, 1988, Ser. No. 176,139
Term of patent 14 years
U.S. Cl. D15—15



310,375
MOTORIZED SAW UNIT
Louis C. Brickner; Michael P. McKee; Raymond L. Wilson, all of Pittsburgh, and David N. Hollinger, Jr., Glenshaw, all of Pa., assignors to Delta International Machinery Corp., Pittsburgh, Pa.
Filed Jul. 12, 1988, Ser. No. 217,819
Term of patent 14 years
U.S. Cl. D15—133



310,376
RAIL FOR GUIDING AND CARRYING A SAW TOOL OR THE LIKE
Anders Johnsen, Svetsgrind 1, 781 34 Borlänge, Sweden
Filed Oct. 2, 1986, Ser. No. 914,761
Claims priority, application Sweden, Apr. 8, 1986, 86-0838
Term of patent 14 years
U.S. Cl. D15—140

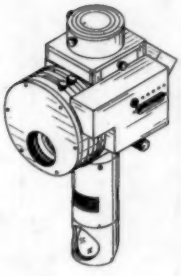
310,377
BIFOCAL LENS OR SIMILAR ARTICLE
Min Y. Wang-Lee, No. 473, Jong Shan S. Road, Yung Kang Hsiang, Tainan Hsien, Taiwan
Filed Jul. 27, 1987, Ser. No. 78,066
Term of patent 14 years
U.S. Cl. D16—101

310,378
EYESHIELD
John P. Russell, 1000 Main St., Gardendale, Ala. 35071
Filed Jul. 28, 1987, Ser. No. 78,543
The portion of the term of this patent subsequent to Sep. 4, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—107

310,379
EYESHIELD
John P. Russell, 1000 Main St., Gardendale, Ala. 35071
Filed Jun. 14, 1988, Ser. No. 206,691
The portion of the term of this patent subsequent to Sep. 4, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D17—107

310,380
CONTACT LENS REMOVER
Robert C. England, Nashport, Ohio, assignor to DMV Corporation, Zanesville, Ohio
Filed Jun. 22, 1987, Ser. No. 65,207
Term of patent 14 years
U.S. Cl. D16—124

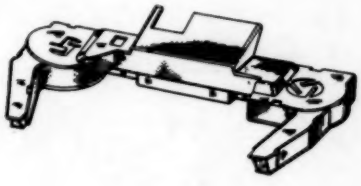
310,381
MULTIPLE FUNCTION IMAGE SWITCHING ATTACHMENT FOR A TELESCOPE OR SIMILAR ARTICLE
Jeffrey R. Charles, 10461 Wininger Cir., Sun City, Ariz. 85351
Filed May 8, 1989, Ser. No. 348,650
Term of patent 14 years
U.S. Cl. D16—136



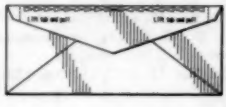
310,382
STILL CAMERA
Barry Wingate, San Jose, and Hartmut H. Esslinger, Los Gatos, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 2, 1987, Ser. No. 56,840
The portion of the term of this patent subsequent to Jul. 31, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D16—209

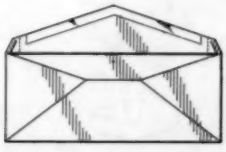
310,383
ELECTRONIC TYPEWRITER
Seiichi Omino, Tokyo, and Takuma Kanno, Hachioji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 4, 1987, Ser. No. 81,163
Claims priority, application Japan, Feb. 9, 1987, 62-4938
Term of patent 14 years
U.S. Cl. D18—1

310,384
RIBBON CASSETTE
Hans W. Mueller, and Kenneth D. Vought, both of Cortland, N.Y., assignors to Smith Coronoa Corporation
Continuation-in-part of Ser. No. 127,002, Nov. 30, 1987. This application Apr. 19, 1988, Ser. No. 185,768
The portion of the term of this patent subsequent to May 22, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—12

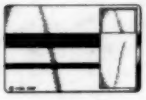


310,385
ENVELOPE
Art Thomson, P.O. Box 1321, Stanton, Calif. 90680
Filed Nov. 9, 1987, Ser. No. 118,867
Term of patent 14 years
U.S. Cl. D19—3



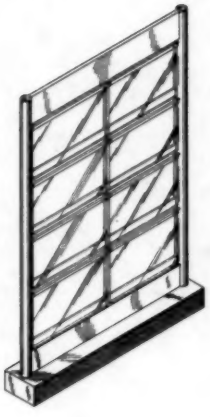


310,386
TRANSACTION CARD
Catherine L. Michels, and Stephen A. Watson, both of San Francisco, Calif., assignors to Visa International Service Association, San Mateo, Calif.
Filed Aug. 7, 1987, Ser. No. 82,811
Term of patent 14 years
U.S. Cl. D19—10



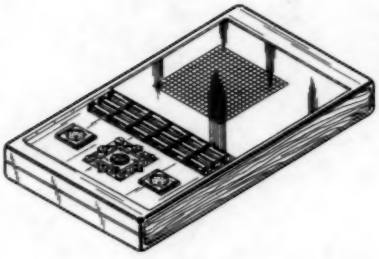
310,387
PUBLICATION VENDING MACHINE
Tom K. Scardino, Dekalb County, Ga., assignor to Haas Publishing Companies, Inc., Norcross, Ga.
Filed May 22, 1987, Ser. No. 53,421
Term of patent 14 years
U.S. Cl. D20—6

310,388
HOLDER FOR DISPLAY SIGNS OR THE LIKE
Dennis Crawford, Carrollton, and Barry Rutherford, Dallas, both of Tex., assignors to Chippenhook, Inc., Lewisville, Tex.
Filed Jun. 3, 1988, Ser. No. 202,938
Term of patent 14 years
U.S. Cl. D20—10

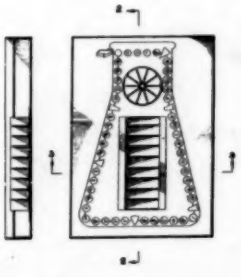


310,389
SIGN
Neville R. Trewarn, 4 Obion Close, Willetton, Western Australia, 6155, Australia
Filed Oct. 8, 1986, Ser. No. 916,852
Term of patent 14 years
U.S. Cl. D20—41

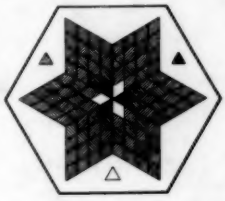
310,390
ELECTRONIC GAME
Joseph C. Besasie, Menomonee Falls, Wis., assignor to Toyogo, Inc., Lexington, Mass.
Filed Feb. 1, 1988, Ser. No. 151,329
Term of patent 14 years
U.S. Cl. D21—13



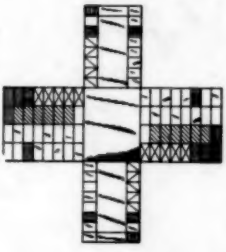
310,391
GAME BOARD
France Leblanc, Lachenaie, Canada, assignor to College Marie-Victoria, Montréal Nord, Canada
Filed Nov. 9, 1987, Ser. No. 120,500
Claims priority, application Canada, Jul. 22, 1987, 22-07-87-9
Term of patent 14 years
U.S. Cl. D21—17



310,392
GAME BOARD
Merlin D. Grimes, 715 Vernon St., Nelson, British Columbia, Canada V1L 4G3
Filed Oct. 28, 1987, Ser. No. 113,724
Claims priority, application Canada, May 28, 1987, 28-05-87-11
Term of patent 14 years
U.S. Cl. D21—24

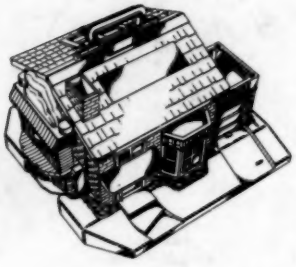


310,393
GAME BOARD
Salem A. S. Al-Heyari, P.O. Box 927192, Amman, Jordan
Filed Jan. 27, 1987, Ser. No. 7,448
Term of patent 14 years
U.S. Cl. D21—32

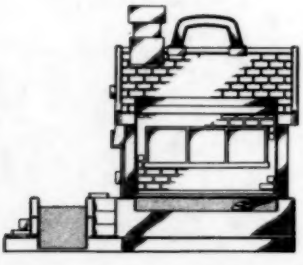


310,394
STACKING TOY
David C. Roy, and Marjorie E. C. Roy, both of Stafford Springs, Conn., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Sep. 29, 1987, Ser. No. 102,091
Term of patent 14 years
U.S. Cl. D21—59

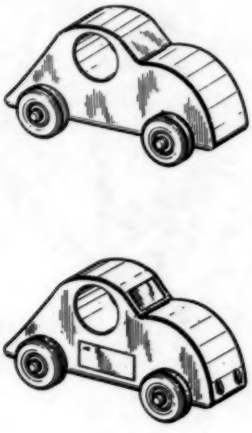
310,395
COMBINED TOY HOUSE AND GARAGE
William J. Maloney, II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 11, 1988, Ser. No. 256,361
Term of patent 14 years
U.S. Cl. D21—114



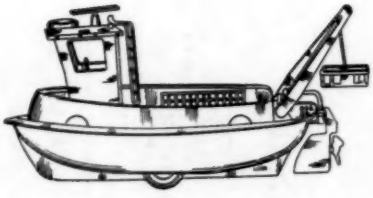
310,396
TOY SCHOOL HOUSE
Craig J. McElhaney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 25, 1988, Ser. No. 262,341
Term of patent 14 years
U.S. Cl. D21—114



310,397
TOY AUTOMOBILE
Paul E. Myers, 719 Vine St., Clyde, Ohio 43410
Filed Dec. 21, 1987, Ser. No. 135,636
Term of patent 14 years
U.S. Cl. D21—128



310,398
TOY BOAT
Gerhard Thieser, Paris, France, assignor to Borden France S.A., Paris, France
Filed Jan. 30, 1987, Ser. No. 9,401
Claims priority, application France, Jul. 31, 1986, 86 4170
Term of patent 14 years
U.S. Cl. D21—130

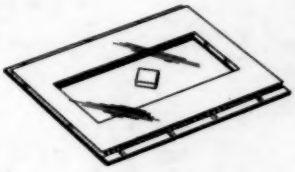


310,399
TOY TRAILER HITCH ELEMENT
Erling T. Diderikssen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 29, 1988, Ser. No. 278,148
Term of patent 14 years
U.S. Cl. D21—141

310,400
TOY GUN
Arthur Guilbeaux, Jr., 3012 South Dr., Groves, Tex. 77619
Filed Apr. 21, 1988, Ser. No. 184,177
Term of patent 14 years
U.S. Cl. D21—148

310,401
DOLL
Victoria Woods, 835 W. Nopal, Mesa, Ariz. 85202, assignor to Victoria Woods; Christine C. Gerst and Janice M. Grienke
Filed Sep. 25, 1987, Ser. No. 101,156
Term of patent 14 years
U.S. Cl. D21—174

310,402
INSECT TRAP
Tristram D. Wyatt, and Owen T. Jones, both of Cardiff, United Kingdom, assignors to University College Cardiff Consultants Limited, Cardiff and Biological Control Systems Ltd., Mid Glamorgan, both of, England
Filed Jul. 19, 1988, Ser. No. 221,378
Claims priority, application United Kingdom, Jan. 20, 1988, 1047809
Term of patent 14 years
U.S. Cl. D22—122



310,403
ICE FISHING INSTRUMENT
John L. Masters, 8522 Old Mesabe Rd., Iron, Minn. 55751
Filed Oct. 30, 1987, Ser. No. 114,379
Term of patent 14 years
U.S. Cl. D22—134

310,404
COMBINED REVERSIBLE SPRINKLER NOZZLE AND SUPPORT RING
Robert W. Hengesbach, 7886 Munson Rd., Mentor, Ohio 44060
Division of Ser. No. 224,249, Jul. 26, 1988, which is a continuation of Ser. No. 20,684, Mar. 2, 1987, which is a continuation-in-part of Ser. No. 674,272, Nov. 23, 1984, which is a continuation-in-part of Ser. No. 461,874, Jan. 28, 1983, Pat. No. D. 282,392. This application Sep. 28, 1989, Ser. No. 414,065
Term of patent 14 years
U.S. Cl. D23—213

310,405

COMBINED HOSE-ATTACHED TELESCOPING PRESSURE SPRAYER AND CONNECTOR FOR ATTACHMENT TO AN ADDITIVE FLUID DISPENSER

Rudy R. Proctor, Costa Mesa, and Fred M. Reinstein, Encino, both of Calif., assignors to Turbo Tek Enterprises, Inc., Los Angeles, Calif.

Division of Ser. No. 77,787, Jul. 27, 1987, Pat. No. Des. 300,453.

This application Jan. 13, 1989, Ser. No. 296,684

Term of patent 14 years

U.S. Cl. D23—226

310,406

ADJUSTABLE UNIT FOR A HAND SHOWER OR THE LIKE

Rocco Cifaldi, 18 Blackthorn Crescent, London, Ontario, Canada N6B 2V6

Filed Nov. 3, 1986, Ser. No. 926,263

Term of patent 14 years

U.S. Cl. D23—263

310,407

WATER CLOSET OR THE LIKE

Henry M. Stairs, Jr., Neshanic, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Dec. 1, 1987, Ser. No. 128,534

Term of patent 14 years

U.S. Cl. D23—301

310,408

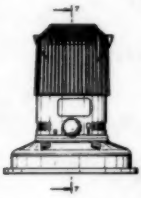
OIL FIRED SPACE HEATER

Yoshio Mito, Gifu, Japan, assignor to Toyotomi Kogyo Co., Ltd., Nagoya, Japan

Filed Feb. 18, 1988, Ser. No. 157,339

Term of patent 14 years

U.S. Cl. D23—348



310,409

AIR CONDITIONING UNIT

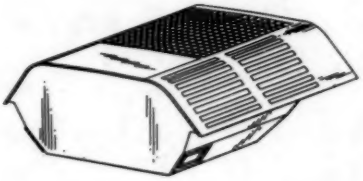
Keith R. Allen, Moorebank; Jeffrey Crawford, Drummoyne, and Geoffrey Rule, St. Clair, all of Australia, assignors to Sigma Air Conditioning Pty, Limited, New South Wales, Australia

Filed Oct. 15, 1987, Ser. No. 109,691

Claims priority, application Australia, Apr. 16, 1987, 1303/87

Term of patent 14 years

U.S. Cl. D23—351



310,410

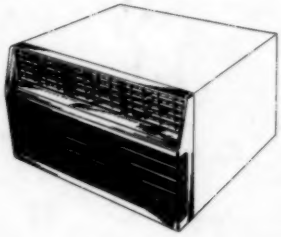
ROOM AIR CONDITIONER GRILL

David M. Lapychak, San Antonio, Tex.; James D. Alsup, Jr.; James B. Watson, both of Conyers, Ga., and Edwin G. Gullet, Fayetteville, Ga., assignors to Freidrich Air Conditioning & Refrigeration Co., San Antonio, Tex.

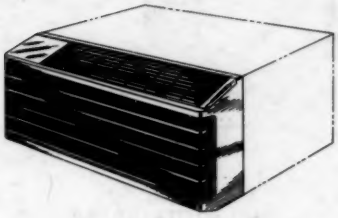
Filed Sep. 21, 1988, Ser. No. 247,302

Term of patent 14 years

U.S. Cl. D23—354

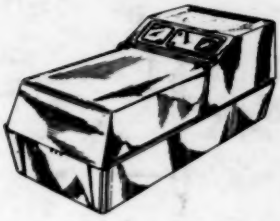


310,411
ROOM AIR CONDITIONER GRILL
David M. Lapychak, San Antonio, Tex.; James D. Alsup, Jr.; James B. Watson, both of Conyers, Ga., and Edwin G. Gullet, Fayetteville, Ga., assignors to Friedrich Air Conditioning & Refrigeration Co., San Antonio, Tex.
Filed Sep. 21, 1988, Ser. No. 247,307
Term of patent 14 years
U.S. Cl. D23—354



310,412
DEHUMIDIFIER
Toru Fukumoto, and Shusuke Yamazaki, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jan. 28, 1988, Ser. No. 149,617
Claims priority, application Japan, Aug. 18, 1987, 62-33332
Term of patent 14 years
U.S. Cl. D23—359

310,413
SAMPLE PROCESSOR
William E. Bigler; Michael S. Cherepak; Kenneth D. Collister, and Cynthia S. Postma, all of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.
Filed Dec. 17, 1987, Ser. No. 133,993
Term of patent 14 years
U.S. Cl. D24—17



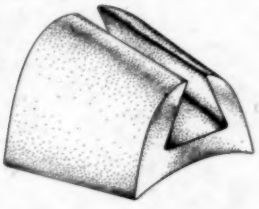
310,414
TAPE RETAINER FOR ENDOTRACHEAL TUBE
Stephen W. Briggs, III, 6807 Hickory Ave., Orangevale, Calif. 95662
Filed Oct. 26, 1987, Ser. No. 112,773
Term of patent 14 years
U.S. Cl. D24—34

310,415
SPA STEP UNIT
Ralph D'Innocente, Pittsburg, and James R. Pauls, Concord, both of Calif., assignors to Jacuzzi Whirlpool Bath, Walnut Creek, Calif.
Filed Sep. 4, 1987, Ser. No. 93,386
Term of patent 14 years
U.S. Cl. D24—38

310,416
PORTABLE MASSAGER
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka, Japan
Filed Jun. 30, 1987, Ser. No. 68,853
Term of patent 14 years
U.S. Cl. D24—40

310,417
DISPOSABLE NURSER BOTTLE HOLDER
Donald W. Herritz, Reedsburg, Wis., assignor to Gerber Products Company, Fremont, Mich.
Filed Dec. 7, 1987, Ser. No. 130,332
Term of patent 14 years
U.S. Cl. D24—48

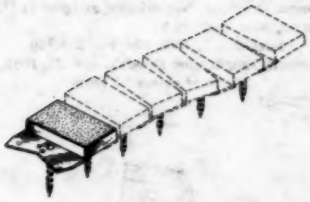
310,418
BABY BOTTLE HOLDER
Leslie L. Tribolet, 5655 Paseo de la Tirada, Tucson, Ariz. 85715
Filed Jul. 6, 1988, Ser. No. 215,943
Term of patent 14 years
U.S. Cl. D24—48



310,419
PERMANENT PHOTOGRAPHIC MEMORIAL MARKER
Artie J. Morvant, 309 Amis St., Thibodeaux, La. 70203
Filed Jun. 22, 1987, Ser. No. 64,458
Term of patent 14 years
U.S. Cl. D99—17

310,420
BUILDING
Robert E. Beaman, and Willis F. Clark, both of Indianapolis, Ind., assignors to Laughner Brothers, Inc., Indianapolis, Ind.
Filed Sep. 21, 1987, Ser. No. 99,211
Term of patent 14 years
U.S. Cl. D25—22

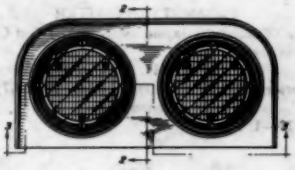
310,421
FLAT BRICK BORDER SECTION
Lavergne Nauseda, Antioch, Ill., and Hayden Leason, Humacao, P.R., assignors to Filtertek, Inc., Hebron, Ill.
Filed Aug. 5, 1987, Ser. No. 82,251
Term of patent 14 years
U.S. Cl. D25—113



310,422
LIGHT BULB
John D. Shupe, P.O. Box 1716, Natchez, Miss. 39120
Filed Dec. 26, 1985, Ser. No. 813,578
Term of patent 14 years
U.S. Cl. D26—4

310,423
TWIN BEAM QUARTZ-HALOGEN OFF ROAD AUTOMOBILE HEADLIGHT
Marc R. Iscovelli, Miami, Fla., assignor to Rally Accessories Inc., Miami, Fla.
Filed Dec. 29, 1986, Ser. No. 947,583
Term of patent 14 years
U.S. Cl. D26—35

310,424
AUXILIARY VEHICLE DUAL WARNING LIGHT
Joseph E. Bander, 333 Holiday Dr., Springfield, Ohio 45505
Filed Oct. 21, 1987, Ser. No. 110,803
Term of patent 14 years
U.S. Cl. D26—35



310,425
FLASHLIGHT
Raymond L. Sharrah, Collegeville, Pa., assignor to Streamlight, Inc., Norristown, Pa.
Filed May 6, 1987, Ser. No. 46,948
The portion of the term of this patent subsequent to Apr. 24, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—49

310,426
TRIPOD LANTERN SUPPORT
Earl T. Rook, HC67, Box 180, Ash Flat, Ark. 72513
Filed Jan. 27, 1987, Ser. No. 7,444
Term of patent 14 years
U.S. Cl. D26—138

310,427
CIGARETTE LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed May 9, 1988, Ser. No. 191,661
Claims priority, application Japan, Nov. 19, 1987, 62-47101
Term of patent 14 years
U.S. Cl. D27—154

310,428
PIVOTAL SAFETY RAZOR
Paul Gerardiello, 106 Eyland Ave., Succa Sunna, N.J. 07876
Filed Dec. 9, 1988, Ser. No. 288,101
Term of patent 14 years
U.S. Cl. D28—48

310,429
ELECTRIC SHAVER
Willem Anema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 7, 1988, Ser. No. 216,740
Claims priority, application Benelux, Jan. 22, 1988, 62908-00
Term of patent 14 years
U.S. Cl. D28—51

310,430
ELECTRIC SHAVER
Hsiu-Chen Shih, Changhua, Taiwan, assignor to Benz Electronic Co., Ltd., Changhua, Taiwan
Filed Nov. 7, 1988, Ser. No. 268,541
Term of patent 14 years
U.S. Cl. D28—49

310,431

GAS DELIVERY MASK

Howard G. Belim, The Priory, Great Britain, assignor to Lifeline Limited, Vale, Channel Islands

Filed Jul. 24, 1987, Ser. No. 77,180

Claims priority, application United Kingdom, Jan. 30, 1987, 1039627

Term of patent 14 years

U.S. Cl. D29—8

310,432

WELDING HELMET

E. L. Boochard, Kent City, Mich., assignor to Jackson Products, Inc., Belmont, Mich.

Filed Mar. 18, 1988, Ser. No. 169,752

Term of patent 14 years

U.S. Cl. D29—9

310,433

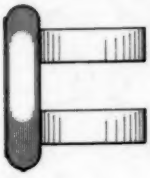
FLOATATION KNEE PAD

Michael L. Zierke, 321 W. Madison St., Belvidere, Ill. 61008

Filed Sep. 2, 1988, Ser. No. 240,116

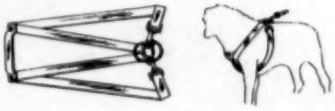
Term of patent 14 years

U.S. Cl. D29—10

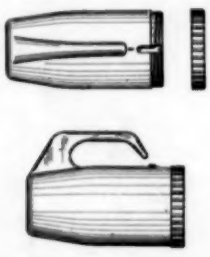


310,434
MOTORCYCLE HELMET WITH LIGHT
William N. Breece, 2524 N. Tamiami Trail #301, North Fort Meyers, Fla. 33917
Filed Nov. 9, 1987, Ser. No. 118,802
Term of patent 14 years
U.S. Cl. D29—13

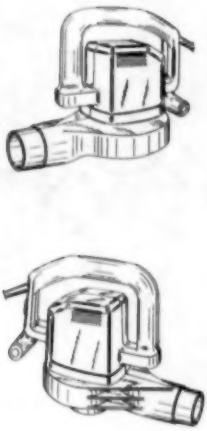
310,435
DOG HANDLER
Floyd M. Cleveland, Lantana, Fla., assignor to Virgo Industries, Inc., Lake Worth, Fla.
Filed Feb. 13, 1989, Ser. No. 272,867
Term of patent 14 years
U.S. Cl. D30—152



310,436
COMBINED PET WASTE CONTAINER AND COVER THEREFOR
Rodney A. Krauth, 2607 Monroe St., Madison, Wis. 53711
Filed Jul. 21, 1988, Ser. No. 222,731
Term of patent 14 years
U.S. Cl. D30—161



310,437
COMBINED PORTABLE POWER VACUUM AND BLOWER
Martin P. Gierke, and Robert P. Straub, both of Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 9, 1987, Ser. No. 118,835
Term of patent 14 years
U.S. Cl. D32—15



310,438
VACUUM CLEANER
Stephen R. Burns, Duluth, Ga., assignor to Ryobi Motor Products Corp., Pickens, S.C.
Filed Aug. 17, 1987, Ser. No. 85,930
Term of patent 14 years
U.S. Cl. D32—22

310,439

ELECTRIC IRON

Jan Klok, Hoogezand, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,768

Claims priority, application United Kingdom, Jul. 15, 1987, 1043495

Term of patent 14 years

U.S. Cl. D32—70

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TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF SEPTEMBER, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom: *See*—
Erkki, Kiskila; and Rolf, Ryham, 4,953,607, Cl. 159-13.300.

A. B. Dick Company: *See*—
Potzler, J. Edward; and Strahan, Daryl J., 4,955,032, Cl. 364-525.000.

A. O. Smith Corporation: *See*—
Akkala, Marc W.; and Walther, Kenneth R., 4,953,510, Cl. 122-17.000.
Houle, Timothy H.; and Schurter, Robert M., 4,954,172, Cl. 204-197.000.
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Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,954,004, Cl. 403-13.000.

Abbott Laboratories: *See*—
Giuliani, David; and Vurek, Gerald G., 4,954,129, Cl. 604-53.000.
Yost, David A.; Russell, John C.; and Yang, Heechung, 4,954,452, Cl. 436-524.000.

ABC/Sebrn TechCorp.: *See*—
Shannon, Joseph W., 4,953,751, Cl. 222-14.000.

Abe, Hideaki: *See*—
Kawamoto, Tetsuo; Motohashi, Ryo; Sakamoto, Toshihiro; Suzuki, Yasuo; and Abe, Hideaki, 4,954,736, Cl. 316-156.000.

Abe, Kouichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Crank angle detector for an engine. 4,953,531, Cl. 123-414.000.

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Mackawa, Junichi; Abe, Masanori; Iesaga, Hirofumi; and Hashimoto, Shigeaki, 4,953,910, Cl. 296-223.000.

Abe, Osamu: *See*—
Sasaki, Masahiro; Abe, Osamu; and Ishikawa, Hideaki, 4,953,513, Cl. 123-489.000.

Abe, Shinya: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.

Abe, Tadashi; Manabe, Mitsuyoshi; Deguchi, Koji; Uhara, Hiroyuki; and Aoki, Yukio, to Sumitomo Chemical Company, Ltd.; and Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for production of methacrylic acid. 4,954,650, Cl. 562-534.000.

Abe, Takao: *See*—
Koshizuka, Kunihiro; and Abe, Takao, 4,954,390, Cl. 428-212.000.

Abe, Teruyoshi: *See*—
Takajo, Shigeaki; Furukimi, Osamu; Ogura, Kuniaki; Maruta, Keiichi; Abe, Teruyoshi; and Sakurada, Ichio, 4,954,171, Cl. 75-246.000.

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Markow, Paul A.; and Nolle, William, 4,953,797, Cl. 242-7.110.

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Nakao, Toshiyuki; and Adachi, Naomichi, 4,954,122, Cl. 475-160.000.

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Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderhold, James L., Jr., 4,954,241, Cl. 208-59.000.

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Vincent, Michel; Baliarda, Jean; Marchand, Bernard; and Remond, Georges, 4,954,640, Cl. 548-490.000.

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Adler, David: *See*—
Ovshinsky, Stanford R.; and Adler, David, 4,954,182, Cl. 136-249.000.

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Advanced Cardiovascular Systems, Inc.: *See*—
Tremulis, William S., 4,953,553, Cl. 128-637.000.

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Wanderman, Drew; and Weinberg, Matthew, 4,954,455, Cl. 437-31.000.

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Auvinen, Stuart T.; and Hoberman, Barry A., 4,954,987, Cl. 365-189.020.
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Durda, Joseph A., 4,954,295, Cl. 261-16.000.

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Commes, Bernard, 4,953,428, Cl. 81-9.400.

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Vedder, Hans J., 4,953,927, Cl. 350-6.800.

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Rauh, Hans-Jurgen, 4,953,805, Cl. 242-58.600.

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Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schicksaneder, Helmut; and Ahrens, Kurt-Henning, 4,954,501, Cl. 514-252.000.

Aigner, Rudolf; Muller, Gunther; Muller, Rainer; and Reuner, Horst, to Hoechst Aktiengesellschaft. Process for the preparation of sulfated alkanol oxethylates or alkylphenol oxethylates having a lowered content of 1,4-dioxane. 4,954,646, Cl. 558-31.000.

Ainsworth, Mark D.: *See*—
Piper, James A.; and Ainsworth, Mark D., 4,955,027, Cl. 372-18.000.

Air Products and Chemicals, Inc.: *See*—
Burgoyne, William F., Jr.; Langsam, Michael; and Fowlkes, Robert L., 4,954,144, Cl. 55-16.000.
Fioravanti, Kenneth J.; Zelson, Larry S.; and Baukal, Charles E., Jr., 4,954,076, Cl. 431-116.000.

Airmaster Fan Company: *See*—
Gregorich, Daniel A.; and Breining, Frank E., 4,953,698, Cl. 206-319.000.

Aisin A W Co. Ltd.: *See*—
Moroto, Shuzo; Kawai, Masao; Yokoyama, Shoji; Kobayashi, Koji; and Sumiya, Koji, 4,954,959, Cl. 364-449.000.

Aisin Seiki Kabushiki Kaisha: *See*—
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Osumi, Toru; Ito, Shoji; and Hashimoto, Kenji, 4,953,825, Cl. 251-129.170.
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Aisin Seiko Co. Ltd.: *See*—
Yamada, Yukifumi; Terada, Takami; and Hibino, Keiichi, 4,953,676, Cl. 192-8.00C.

Akao, Shinichi: *See*—
Noji, Toshiyuki; Yoshida, Hidetoshi; Tatsumi, Eiji; Akao, Shinichi; and Kosaka, Hideyuki, 4,953,330, Cl. 52-167.0DF.

Akasaka, Kozo: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.

Akerfeldt, Dan, to C. R. Bard, Inc. Tissue sampling device. 4,953,558, Cl. 128-751.000.

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Albert Handtmann, Maschinenfabrik GmbH & Co. KG: *See*—
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Albertini, Peter: *See*—
Weihe, Clyde; Marotti, Lewis; and Albertini, Peter, 4,954,250, Cl. 209-629.000.

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Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, 4,954,961, Cl. 364-484.000.

Alcatel N.V.: *See*—
Kuppers, Dieter; Herse, Klaus; Hiepe-Wohlleben, Kate; Kaiser, Manfred; Mohr, Friedemann; and Ohnsorge, Horst, 4,955,014, Cl. 370-3.000.
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Alcatel Thomson Gigadisc: *See*—
Collomby, Michel; Bec, Daniel; and Gerard, Jean-Louis, 4,955,008, Cl. 369-32.000.

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Lo, Ying-Ching; Zambre, Samuel; and Escorcio, Tolentino, 4,954,960, Cl. 364-484.000.

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Aldridge, Clyde L.: *See*—
Eidt, Clarence M., Jr.; Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,954,240, Cl. 208-50.000.

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Nitecki, Danute E.; and Aldwin, Lois, 4,954,637, Cl. 548-546.000.

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Alferness, Rodney C.; Eisenstein, Gadi; Koren, Uziel; Tien, Ping K.; Tucker, Rodney S.; and Whalen, Matthew S., to AT&T Bell Laboratories. Wavelength tunable composite cavity laser. 4,955,028, Cl. 372-20.000.

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DeVolk, Burton; Allen, Fritz; Newman, Cathy D.; and Frantz, Robert J., 4,953,980, Cl. 356-338.000.

Allflex New Zealand Limited: *See*—
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Alligator Ventilfabrik GmbH: *See*—
Franke, Horst; and Schmid, Hans-Jorg, 4,953,394, Cl. 73-146.500.

Alpegiani, Marco; Perrone, Ettore; Orezzi, Piergiuseppe; Carminati, Paolo; and Cassinelli, Giuseppe, to Farmitalia Carlo Erba S.r.l. 6-substituted penem esters as anti-inflammatory and anti-degenerative agents. 4,954,493, Cl. 514-195.000.

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Arbouw, Willem D., 4,953,451, Cl. 98-98.000.

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Ponchel, Basil M.; and Walsh, James D., 4,954,188, Cl. 148-417.000.

Alza Corporation: *See*—
Gale, Robert M., 4,954,344, Cl. 424-448.000.

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AMAX Inc.: *See*—
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Case, Andrew B., 4,954,168, Cl. 423-55.000.

Ambasz, Emilio. Expandable luggage. 4,953,673, Cl. 190-103.000.

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Barsimanto, Albert; and Ambats, Maris, 4,954,750, Cl. 315-111.810.

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Lynch, John F., 4,954,313, Cl. 419-9.000.

Amedco Health Care, Inc.: *See*—
Birkmann, Kenneth R., 4,953,243, Cl. 5-60.000.

American Colloid Company: *See*—
Anderson, Mark, 4,954,562, Cl. 524-779.000.

American Cyanamid Company: *See*—
Dauplaise, David L.; Kozakiewicz, Joseph J.; and Schmitt, Joseph M., 4,954,538, Cl. 523-223.000.
Gripp, Anna A.; and Metzler, Gottfried, III, 4,954,337, Cl. 424-73.000.
Pidskalny, Ronald S.; and Kneeshaw, Paul G., 4,954,161, Cl. 71-88.000.
Riefler, R. Scott; and Powers, John W., 4,954,382, Cl. 428-116.000.

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Insetta, Victor D.; Monsorno, Richard V.; and Dorrian, John F., 4,953,273, Cl. 29-25.420.

Ames, Marc L. Pool cue bridge. 4,953,860, Cl. 273-23.000.

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Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderhold, James L., Jr., 4,954,241, Cl. 208-59.000.
Lee, Min-Hsiun; and Pendergraft, Paul T., 4,954,331, Cl. 423-574.00R.
Miller, Jeffrey T.; and Shum, Victor K., 4,954,245, Cl. 208-138.000.

AMP Incorporated: *See*—
McCleerey, Earl W., 4,954,100, Cl. 439-492.000.

AMPAFRANCE: *See*—
Bigo, Jean, 4,953,667, Cl. 188-31.000.

Ampe, Frank: *See*—
Van Bogaert, Philippe; and Ampe, Frank, 4,953,597, Cl. 139-452.000.

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Wronkiewicz, Robert D.; and Moehling, Charles, 4,953,471, Cl. 105-198.400.

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Amstutz, Douglas D.; and Vanderboegh, Ronald A., 4,955,044, Cl. 362-125.000.

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Andersen, Jorn W., to Ball Corporation. Tandem molding of plastic containers. 4,954,310, Cl. 264-520.000.

Anderson, Andrew A.: *See*—
Coombs, Donald W.; and Anderson, Andrew A., 4,953,865, Cl. 273-176.00F.

Anderson, Clark L.: *See*—
Fanger, Michael W.; Guyre, Paul M.; and Anderson, Clark L., 4,954,617, Cl. 530-387.000.

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Olson, Jack R.; Hitney, Herbert V.; Paulus, Richard A.; and Anderson, Kenneth D., 4,953,986, Cl. 374-136.000.

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Iwamoto, Mune; Ito, Norifumi; Sugazaki: Kazuo; Matsubara, Tetsuyuki; and Ando, Toshihiko, 4,954,571, Cl. 525-205.000.

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Dohse, Hans-Peter, 4,953,294, Cl. 30-276.000.

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Aneha, Akira: *See*—
Kohno, Naoichi; Arai, Masahiro; Aneha, Akira; and Fujisaki, Michio, 4,954,820, Cl. 340-825.690.

Anheuser-Busch Companies, Inc.: *See*—
Kross, James R., 4,953,688, Cl. 198-434.000.

Annin, David R.; and Kelley, Rusty L. Portable screen. 4,953,609, Cl. 160-24.000.

Anthony, Thomas R.; DeVries, Robert C.; Engler, Richard A.; Ettinger, Robert H.; and Fleischer, James F., to General Electric Company. Apparatus for synthetic diamond deposition including curved filaments and substrate cooling means. 4,953,499, Cl. 118-724.000.

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Oriez, Robert; and Gras, Elie. 4,954,073, Cl. 425-547.000.

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Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao. 4,954,575, Cl. 525-330.500.

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Aoki, Masaki; Torii, Hideo; Kuribayashi, Kiyoshi; Monji, Hideto; Umetani, Makoto; and Fujii, Eiji, to Matsushita Electric Industrial Co., Ltd. Information storage stamper and method of manufacturing disks using the same. 4,953,385, Cl. 72-462.000.

Aoki, Noboru: *See*—
Suzuki, Takahiro; Izuoka, Yuki; and Aoki, Noboru. 4,954,743, Cl. 313-120.000.

Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for controlling direct coupling mechanism in hydrodynamic driving apparatus. 4,953,677, Cl. 192-3.300.

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Aoki, Yoshiharu; and Hamano, Toshikatsu, to Asahi Glass Company Ltd. Method and apparatus for recovering sulfuric acid from a titanium sulfate waste liquor. 4,954,262, Cl. 210-638.000.

Aoki, Yukio: *See*—
Abe, Tadashi; Manabe, Mitsuyoshi; Deguchi, Koji; Uhara, Hiroyuki; and Aoki, Yukio. 4,954,650, Cl. 562-534.000.

Aotsu, Hiroaki: *See*—
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari. 4,954,818, Cl. 340-721.000.

Aoyama, Takashi: *See*—
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji. 4,954,855, Cl. 357-23.700.

Apex Medical Technologies, Inc.: *See*—
McGlothlin, Mark W.; and DePaul, Alice A., 4,954,309, Cl. 264-307.000.

Appel, Eggert; Kiene, Wilfried; Kuchemann, Rudi; Meier, Dieter; and Nissen, Peter, to Fischer & Porter Company. Capacitive type electromagnetic flowmeter. 4,953,408, Cl. 73-861.160.

Appelbaum, Paul. Shackleless padlock. 4,953,371, Cl. 70-32.000.

Applegate, Donald W., to Pem All Fire Extinguisher Corporation. Protected L-shaped environment using single chemical nozzle. 4,953,623, Cl. 169-37.000.

Applied Materials, Inc.: *See*—
Ebbing, Peter; and Birang, Manoocher, 4,953,982, Cl. 356-357.000.

Apti, Inc.: *See*—
Zigler, Arie; Eisen, Yosset; and Eisen, Yossef, 4,954,709, Cl. 250-385.100.

Arai, Masahiro: *See*—
Kohno, Naoichi; Arai, Masahiro; Ancha, Akira; and Fujisaki, Michio, 4,954,820, Cl. 340-825.690.

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Hashizume, Junichiro; Takei, Tetsuya; Iida, Shigehira; Saitoh, Keishi; and Arai, Takayoshi, 4,953,498, Cl. 118-719.000.

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Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.

Arai, Tatsuo: *See*—
Tsujimura, Osamu; Arai, Tatsuo; and Saito, Takayoshi, 4,954,021, Cl. 407-35.000.

Araki, Nobuo; Tabata, Kazufumi; Yokoi, Kiyomi; and Ashidate Tadami, to Nippon Steel Welding Products & Engineering Co., Ltd. Method for inserting thread into tube. 4,953,827, Cl. 254-134.400.

Arata, Yoshiaki; and Oda, Tatsuharu. Apparatus for producing ultra-high power ultra-high density laser beam. 4,953,950, Cl. 350-174.000.

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Arbouw, Willem D., to Aluart Aluminum B.V. Ventilation device. 4,953,451, Cl. 98-98.000.

Arima, Tatsunori, to Kabushiki Kaisha Toshiba. Control apparatus for a two-sided/multiple copy conveying unit. 4,954,848, Cl. 355-319.000.

Arimune, Hisao: *See*—
Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, 4,954,232, Cl. 204-192.230.

Arisaka, Tomokichi; and Yamaguchi, Mitsuyoshi, to Kabushiki Kaisha ALPS TOOL. Apparatus for rotatably supporting and feeding elongated rod member. 4,953,429, Cl. 82-127.000.

Armbruster, Joseph M. Air circulation device. 4,954,049, Cl. 417-234.000.

Armitage, Albert, to Westinghouse Electric Corp. Fuel metering bin level control. 4,953,474, Cl. 110-101.0CD.

Arnold, Brian K.: *See*—
Sare, Ian R.; Henderson, Ian; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,953,612, Cl. 164-102.000.

Arnold Jager: *See*—
Jager, Andreas, 4,953,920, Cl. 305-35.0EB.

Aron, Jerome, to Kuhn S.A. Tractor driven farm machine. 4,953,346, Cl. 56-11.100.

Arsenault, Duane R., to Arsenault, Duane R.; and Kirby, Alan J. Toy roadway tile. 4,953,786, Cl. 238-10.00B.

Asahi Glass Company Ltd.: *See*—
Aoki, Yoshiharu; and Hamano, Toshikatsu, 4,954,262, Cl. 210-638.000.

Asahi Kogaku Kogyo K.K.: *See*—
Kitazawa, Toshiyuki, 4,954,859, Cl. 354-173.110.

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Morimoto, Akira, 4,953,926, Cl. 350-6.800.

Asai, Kohtaro; Murakami, Tokumichi; and Matsuzaki, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Buffer controlled picture signal encoding and decoding system. 4,954,892, Cl. 358-133.000.

Asano, Seiji: *See*—
Mochida, Mitsuyoshi; Maekawa, Tokuo; Takei, Hisashi; Matsumoto, Yasuo; Ohmura, Hiroshi; Sugimoto, Shigeru; Ushiro, Seimei; Asano, Seiji; and Yoshida, Toshio, 4,954,857, Cl. 354-75.000.
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.

Asbeck, Adolf: *See*—
Schmid, Karl H.; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Scharf, Rolf, 4,954,283, Cl. 252-135.000.

Asea Brown Boveri Ltd.: *See*—
Bauer, Friedhelm, 4,954,869, Cl. 357-38.000.
Loutan, Dominique, 4,953,726, Cl. 213-1.300.

Asea Brown Boveri Ltd: *See*—
Tomljenovic, Nenad, 4,955,072, Cl. 455-108.000.

Ash, Doris H.: *See*—
Gautney, Joe; Worley, Shelby D.; and Ash, Doris H., 4,954,156, Cl. 71-28.000.

Ashidate Tadami: *See*—
Araki, Nobuo; Tabata, Kazufumi; Yokoi, Kiyomi; and Ashidate Tadami, 4,953,827, Cl. 254-134.400.

Ashok, Sankaranarayanan; Cheskis, Harvey P.; and Shapiro, Eugene, to Olin Corporation. Extrusion of strip material. 4,953,382, Cl. 72-262.000.

Asmar, Romeal F., to Boeing Company, The. Optical encoder reading device. 4,953,933, Cl. 350-96.150.

Aspin, Ronald E.: *See*—
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Association pour la Recherche et le Developpement des Methods et Processus Industriels: *See*—
Bourgeois, Jean-Paul, 4,954,620, Cl. 536-56.000.

AST Research, Inc.: *See*—
Baran, Jozef B., 4,954,929, Cl. 361-414.000.

Astolfi, Pietro, to Pico-Glass, S.P.A. Panel to be applied to back of a picture frame for retaining the picture and its protective panel. 4,953,312, Cl. 40-156.000.

AT&T Bell Laboratories: *See*—
Alferness, Rodney C.; Eisenstein, Gadi; Koren, Uziel; Tien, Ping K.; Tucker, Rodney S.; and Whalen, Matthew S., 4,955,028, Cl. 372-20.000.
Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., 4,955,016, Cl. 370-60.000.
Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., 4,955,017, Cl. 370-60.000.
Venutolo, John H., 4,954,453, Cl. 437-8.000.
Wei, Lee-Fang, 4,955,021, Cl. 370-124.000.
Wojcik, Thaddeus, 4,953,460, Cl. 101-129.000.

Atago, Takeshi: *See*—
Nagano, Masami; and Atago, Takeshi, 4,953,532, Cl. 123-419.000.

Atlantic Richfield Company: *See*—
Bloys, J. Benjamin; Carpenter, Robert B.; and Wilson, William N., 4,953,620, Cl. 166-293.000.

Atlas Powder Company: *See*—
Reiss, Peter F., 4,953,464, Cl. 102-312.000.

Atochem: *See*—
Emily, Jean Y., 4,953,482, Cl. 111-144.000.

Atsugi Motor Parts Company Limited: *See*—
Komatsu, Koichi, 4,953,416, Cl. 74-388.0PS.

Aubertin-Herve, Andre-Jacques; and Giffard, Benoit, to Commissariat a l'Energie Atomique. MIS type static memory cell and memory and storage process. 4,954,989, Cl. 365-177.000.

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Gautney, Joe; Worley, Shelby D.; and Ash, Doris H., 4,954,156, Cl. 71-28.000.

August, Alfred A., Sr.; and Jackson, Anthony M., to Safety by Design, Inc. Portable warning device. 4,954,813, Cl. 340-571.000.

Austin, George H., to Sewell Plastics, Inc. Calibrating blow pin. 4,954,071, Cl. 425-531.000.

Austin, Paul B.: *See*—
Graff, James C.; and Robertson, Frederick K., 4,953,718, Cl. 211-123.000.

Australian National University, The: *See*—
Cooper, Peter D., 4,954,622, Cl. 536-127.000.
Automobile Citroen: *See*—
Lescaut, Emmanuel, 4,953,651, Cl. 180-132.000.
Automobiles Peugeot: *See*—
Lescaut, Emmanuel, 4,953,651, Cl. 180-132.000.
Auvinen, Stuart T.; and Hoberman, Barry A., to Advanced Micro Devices, Inc. Interleaved sensing system for FIFO and burst-mode memories. 4,954,987, Cl. 365-189.020.
Avantek, Inc.: *See*—
Barber, Richard G., 4,954,790, Cl. 332-164.000.
Avanzino, Steven C.; and Haskell, Jacob D., to Advanced Micro Devices, Inc. Method of planarization of topologies in integrated circuit structures. 4,954,459, Cl. 437-228.000.
AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof.Dr.Dr.h.c Hans List: *See*—
Krempl, Peter W.; Schindler, Wolfgang; and Schiefer, Erich J., 4,953,390, Cl. 73-116.000.
Awaji, Hiroshi: *See*—
Uekita, Masakazu; and Awaji, Hiroshi, 4,954,608, Cl. 528-350.000.
Axti Pty Ltd.: *See*—
Rankin, Martin D., 4,954,676, Cl. 219-200.000.
Azeta, Takahiro; Kameyama, Toru; Sekiya, Harukazu; Moritani, Toshifumi; Higeta, Akira; Baba, Kenji; Matoba, Takeshi; Goto, Shinji; and Kubota, Kazuyuki, to Canon Kabushiki Kaisha; and Nippon Seimitsu Kogyo Kabushiki Kaisha. Apparatus for conveying a sheet obliquely. 4,953,846, Cl. 271-251.000.
B-J Trading Limited: *See*—
Hara, Akira, 4,953,463, Cl. 101-425.000.
Baba, Hisatoshi, to Canon Kabushiki Kaisha. Information recording/reproducing apparatus with control device for maintaining head velocity below a critical velocity. 4,955,011, Cl. 369-54.000.
Baba, Kenji: *See*—
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Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Suzuki, Koichi, to Nissan Chemical Industries Ltd. Substituted benzoyl derivatives and selective herbicides. 4,954,165, Cl. 71-103.000.
Babidge, John C.: *See*—
Prime, Martlyn L.; Warren, Peter F.; Johnston, Geoffrey D.; and Babidge, John C., 4,953,730, Cl. 217-4.000.
Baghdachi, Jamil; and Mahoney, Keith H., to BASF Corporation. Fast-cure polyurethane sealant composition containing silyl-substituted guanidine accelerators. 4,954,598, Cl. 528-22.000.
Bagley, Jerome R.; and Spencer, H. Kenneth, to BOC, Inc. N-heterocyclic-N-(4-piperidinyl)amides and pharmaceutical compositions and methods employing such compounds. 4,954,506, Cl. 514-272.000.
Bagrodia, Shriram; and Phillips, Bobby M., to Eastman Kodak Company. Modified grooved polyester fibers and process for production thereof. 4,954,398, Cl. 428-400.000.
Bahr, Diethelm, to Hoesch AG. Caged comb for a large roller bearing. 4,953,993, Cl. 384-623.000.
Bailey, Fay W., to Phillips Petroleum Company. Process for cleaning polymer processing equipment. 4,954,545, Cl. 524-158.000.
Ballet, Alain; Loisel, Francois; and Paulin, Daniel, to Legrand. Magazine-type wiring accessory crimping tool. 4,953,384, Cl. 72-410.000.
Baird, Charles A.; and Collins, Noel, to Harris Corporation. Terrain aided passive range estimation. 4,954,837, Cl. 342-458.000.
Baker Hughes Incorporated: *See*—
LeBegue, Maurice K., 4,953,914, Cl. 299-11.000.
Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., 4,953,622, Cl. 166-327.000.
Ross, Richard J.; and Roddy, Jim H., 4,953,617, Cl. 166-187.000.
Baker, Robert D.: *See*—
Ubhayakar, Shivadev K.; and Baker, Robert D., 4,954,952, Cl. 364-513.000.
Bakewell, Joseph J., to Dynamics Research Corporation. Method for making nozzle plates. 4,954,225, Cl. 204-11.000.
Baldecchi, Sauro S.; and Bourgin, Patrick. Apparatus for practicing a pneumatic suction process permitting drawing cables through sheaths. 4,953,828, Cl. 254-134.400.
Baliarda, Jean: *See*—
Vincent, Michel; Baliarda, Jean; Marchand, Bernard; and Remond, Georges, 4,954,640, Cl. 548-490.000.
Ball Corporation: *See*—
Andersen, Jorn W., 4,954,310, Cl. 264-520.000.
Frame, Wayne W., 4,954,900, Cl. 358-213.260.
Ball, Edward R., to Boeing Company, The. Self-checking ohmmeter that checks for contact resistance of its probes. 4,954,782, Cl. 324-538.000.
Ballon, Jean: *See*—
Comparat, Vincent; Ballon, Jean; Carrechio, Pierre; and Pelissier, Alain, 4,954,710, Cl. 250-385.100.
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Hopkins, Thomas R.; and Banasiak, Dennis S., 4,954,354, Cl. 426-8.000.
Bang, Kook B. Golf putter having a mirror. 4,953,866, Cl. 273-183.00D.
Banning, Harmon W.; and Neil, Daniel C., to W. L. Gore & Associates, Inc. Coaxial cable connector assembly. 4,954,669, Cl. 174-75.00C.
Bannon, Robert P., to Shell Oil Company. Vapor/liquid contact apparatus. 4,954,294, Cl. 261-114.100.
Barada, Andrew H., to Perkin-Elmer Corporation, The. Air gauge sensor. 4,953,388, Cl. 73-37.500.
Baran, Ireneusz W.; and Hijuelos, Humberto A., to Maneely-Illinois, Inc. Internal weld bead metallizing system and method. 4,954,682, Cl. 219-76.140.
Baran, Jozef B., to AST Research, Inc. Multi-layer circuit board that suppresses radio frequency interference from high frequency signals. 4,954,929, Cl. 361-414.000.
Barber, Richard G., to Avantek, Inc. Enhanced coupled, even mode terminated baluns, and mixers and modulators constructed therefrom. 4,954,790, Cl. 332-164.000.
Barefoot, Darek. Bicycle pedal attachment. 4,953,425, Cl. 74-534.600.
Barker, David K.: *See*—
Johnston, William T.; Smith, Leslie, Jr.; and Barker, David K., 4,954,039, Cl. 414-500.000.
Barnes, Bruce E.; Furuzawa, Richard; and Kahn, Paul, to Miles Inc. Concentric microaggregate blood filter. 4,954,251, Cl. 210-806.000.
Barnett, Ronald E. Method of inhibiting ice crystal growth in frozen foods and compositions. 4,954,360, Cl. 426-565.000.
Baron, Robert M., to Lockheed Corporation. Apparatus for producing molded articles. 4,954,209, Cl. 156-583.100.
Barone, Frank G., Jr.: *See*—
Savage, Charles; Barone, Frank G., Jr.; Demetrious, Gregory; and Volpe, Vincent, 4,954,958, Cl. 364-444.000.
Barradas, Scott; Farber, Bruce; and Luther, William B., to United States of America, Navy. Seawater hydraulic band saw. 4,953,295, Cl. 30-380.000.
Barrus, Stephen D. Microphone retrieval device. 4,953,809, Cl. 242-107.300.
Barsimanto, Albert; and Ambats, Maris. Flexible ion emitter. 4,954,750, Cl. 315-111.810.
Barson, Clifford W., to Sumitomo Rubber Industries, Limited. Tire test machine. 4,953,392, Cl. 73-146.000.
Bartlett, Philip L.; Creazzo, Joseph A.; and Gorski, Robert A., to Du Pont de Nemours, E. I., and Company. Azeotropes of hydrogen-containing halocarbons with butanes. 4,954,289, Cl. 252-305.000.
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Barton, Barbara J.: *See*—
Little, Vicki A.; and Barton, Barbara J., 4,953,765, Cl. 224-151.000.
Bartuski, William A., to Harsco Corporation. Magnetized ceramic armor system. 4,953,442, Cl. 89-36.020.
Barzynski, Helmut: *See*—
Lamprecht, Josef; Ley, Gregor; Werner, Arend; and Barzynski, Helmut, 4,954,422, Cl. 430-275.000.
BASF Aktiengesellschaft: *See*—
Lamprecht, Josef; Ley, Gregor; Werner, Arend; and Barzynski, Helmut, 4,954,422, Cl. 430-275.000.
Oftring, Alfred; Tschang, Chung-Ji; Winkler, Ekhard; Gotsmann, Guenther; and Glaser, Klaus, 4,954,369, Cl. 427-430.100.
Theobald, Hans; Becker, Rainer; and Himmele, Walter, 4,954,633, Cl. 548-240.000.
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Baghdachi, Jamil; and Mahoney, Keith H., 4,954,598, Cl. 528-22.000.
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Kristen, Edward B.; and Guerrero, Juan R., 4,954,347, Cl. 424-456.000.
Basista, Joseph F.; Ma, Wai M.; and Squires, John J., to International Business Machines. Fiber optic connector assembly and adapter for use therewith. 4,953,929, Cl. 350-96.200.
Bassett, Clarke C. Triradial sail panel configuration without bias edges. 4,953,489, Cl. 114-103.000.
Basten, Aaron K.; and Claassen, Robert W., to Vector Corporation. Filter system for a fluid bed granulator/dryer. 4,953,308, Cl. 34-82.000.
Batt, James A.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., to Allied-Signal Inc. Azeotrope-like compositions of dichloro-trifluoroethane and ethylene oxide. 4,954,284, Cl. 252-170.000.
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Bauer, Friedhelm, to Asea Brown Boveri Ltd. MOS-controlled thyristor (MCT). 4,954,869, Cl. 357-38.000.
Baukal, Charles E., Jr.: *See*—
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Baumann, Hans D. Deflectable sleeve type valve. 4,953,824, Cl. 251-8.000.
Baumgartes, Klaus; and Schloeglmann, Kurt, to Messerschmitt-Boelkow-Blohm GmbH. Mechanical gear drive. 4,953,417, Cl. 74-409.000.
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Bayer Aktiengesellschaft: *See*—
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Bielefeldt, Dietmar; Marhold, Albrecht; and Negele, Michael, 4,954,666, Cl. 570-132.000.
Dicke, Hans-Rudolf; Genz, Joachim; Eckhardt, Volker; and Bottenbruch, Ludwig, 4,954,606, Cl. 528-170.000.
Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, 4,954,577, Cl. 525-420.000.
Genz, Joachim; Dicke, Hans-Rudolf; Eckhardt, Volker; and Kleiner, Frank, 4,954,604, Cl. 528-125.000.
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BCM Manufacturing Ltd.: *See*—
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Becicka, Kenneth F.; and Chamberlain, Neal C., to FMC Corporation. Double telescoping arm for robotic palletizers and the like. 4,954,042, Cl. 414-718.000.

Beck, Anton K.; Withy, Raymond M.; Zabrecky, James R.; and Masiello, Nicholas C., to Integrated Genetics, Inc. Cell encoding recombinant human erythropoietin. 4,954,437, Cl. 435-69.400.

Beck, Richard: *See*—
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Becker, Thomas K.; Casavant, Terry S.; Helm, P. Ralph; Petzold, Terry L.; Wanek, Michael J.; and Zuehlke, Art G, to Manitowoc Company, Inc., The. Crane and lift enhancing beam attachment with moveable counterweight. 4,953,722, Cl. 212-156.000.

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Beer, Jeffrey S.; Gracie, Michael D., Sr.; and Vigano, Tullio U., to Fes-co System USA, Inc. Flexible package with pour spout and handle. 4,953,708, Cl. 206-632.000.

Beery, Jack; and Joiner, Charles W., Jr., to Mead Corporation, The. Method and apapratus for forming a matte finish on resin-coated webs or sheets. 4,954,297, Cl. 264-1.300.

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Behrens, Dieter, to Bayer Aktiengesellschaft. Fine-grained, high-purity earth acid metal powders, a process for their production and their use. 4,954,169, Cl. 75-228.000.

Beicht, Bernd; Tinz, Reinhard; and Heinemann, Joachim, to Carl Freudenberg, Firma. Device for the metered supplying of fuel vapor into the intake pipe of a combustion engine. 4,953,514, Cl. 123-520.000.

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Belak, Maria: *See*—
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Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, to Enichem Sintesi S.p.A. Catalyst on the basis of silicon and titanium having high mechanical strength and a process for its preparation. 4,954,653, Cl. 564-223.000.

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Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Isterweave picture comparison apparatus and method. 4,954,883, Cl. 358-22.000.

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Belt, Roger F.; and Uhrin, Robert, to Litton Systems, Inc. Monocrystalline lanthanum orthogallate laser material. 4,954,211, Cl. 156-617.100.

Bender, Franz, to Daimler-Benz AG. Vacuum supply system in a motor vehicle. 4,953,447, Cl. 91-514.000.

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Benge, S. Eugene, to Monarch Marking Systems, Inc. Tag and method of making same. 4,954,814, Cl. 340-572.000.

Bennett, Christopher E. Holster mounting platform. 4,953,767, Cl. 224-192.000.

Bennett, James G., Jr.; and Chambers, Gregory R., to General Electric Company. Zinc-containing ortho-alkylation catalyst precursor and catalyst, and process of use in alkylation of phenols. 4,954,475, Cl. 502-343.000.

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Berwin, Ted W., to Hughes Aircraft Company. Linear deflection amplifier with energy recovery. 4,954,757, Cl. 315-403.000.

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Best, Steven A., to Exxon Chemical Patents Inc. Homogeneous or supported vanadium based catalyst for olefin polymerization. 4,954,471, Cl. 502-110.000.

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Beymer, Norman; and Kite, Gary W. Foldable rack for positioning a plastic bag as a receptacle and for spare bag storage. 4,953,815, Cl. 248-97.000.

Bhagavatula, Venkata A., to Corning Incorporated. Dispersion transformer having multichannel fiber. 4,953,947, Cl. 350-96.330.

Bielagus, Joseph, to Beloit Corporation. Wood chip cracking apparatus. 4,953,795, Cl. 241-159.000.

Bielefeldt, Dietmar; Marhold, Albrecht; and Negele, Michael, to Bayer Aktiengesellschaft. Process for preparing fluorinated C_4 to C_6 hydrocarbons and novel cyclic fluorinated hydrocarbons and their use as propellant gas and working fluid for heat pump systems. 4,954,666, Cl. 570-132.000.

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Bigo, Jean, to AMPAFRANCE. Wheel breaking device, particularly for a baby carriage. 4,953,667, Cl. 188-31.000.

Billat, Alain E. Multi-purpose cleaning device, in particular for vehicle windows and the like. 4,954,001, Cl. 401-139.000.

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Blackmer, Richard H.; and Hedman, Jonathan W., to Transpirator Technologies, Inc. Method and apparatus for pulmonary and cariovascular conditioning of the young of large animals. 4,953,546, Cl. 128-203.160.
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Blount, David H. Production of silica aerogels. 4,954,327, Cl. 423-338.000.
Bloya, J. Benjamin; Carpenter, Robert B.; and Wilson, William N., to Atlantic Richfield Company. Accelerating set of retarded cement. 4,953,620, Cl. 166-293.000.
Boak, John K.; Cooney, Charles T., Jr.; Schoch, Stephen A.; and Sibley, Howard W., to Carrier Corporation. Corrosion resistant liquid heating module. 4,953,511, Cl. 122-18.000.
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Bornengo, Giorgio; Carlini, Filippo M.; Pontevivo, Michele; and Bottaccio, Giorgio. Process for preparation of perfluoropropane oxide. 4,954,643, Cl. 549-531.000.
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Bottka, Nicholas; Gaskill, D. Kurt; and Glosser, Robert. Non-destructively measuring local carrier concentration and gap energy in a semiconductor. 4,953,983, Cl. 356-445.000.
Bourgeois, Jean-Paul, to Association pour la Recherche et le Developpement des Methods et Processus Industriels. Thermocondensed lignocelluloae material, and a method and an oven for obtaining it. 4,954,620, Cl. 536-56.000.
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Brackmann, Warren A.; Snaidr, Stanislav M.; Nehyo, Takeshi; and Sheahan, Michael H., to Rothmans, Benson & Hedges Inc.; and Rothmans International Services Limited. Cigarette making machine hopper. 4,953,570, Cl. 131-109.100.

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Braun, Walter: *See*—
Ziegler, Hermann; Handte, Horst; Braun, Walter; and Gutzeit, Horst, 4,953,331, Cl. 52-208.000.

Braunstein, Michael; and Huggins, Richard, to Braunstein, Michael. Indoor structure that simulates an outdoor environment. 4,953,848, Cl. 272-8.500.

Breault, John P.; and Dickau, Ewald F., to Loctite Corporation. Modular dispensing system. 4,953,756, Cl. 222-309.000.

Breining, Frank E.: *See*—
Gregorich, Daniel A.; and Breining, Frank E., 4,953,698, Cl. 206-319.000.

Breston, Michael P.: *See*—
Zelli, Joseph M., 4,953,858, Cl. 272-146.000.

Breton, Marcel P.; Deslandes, Yves; and Sacripante, Guerino, to Xerox Corporation. Processes for the preparation of encapsulated toner compositions. 4,954,412, Cl. 430-137.000.

Briggs, Stuart J.: *See*—
Cunningham, Philip; and Briggs, Stuart J., 4,953,444, Cl. 91-1.000.

Brigham, Robert N., to Superior Electric Company, The. Stator winding for two-speed electrodynamic machines having fractional speed ratios. 4,954,740, Cl. 310-185.000.

Bright, Roy L.: *See*—
Szucs, Robert M.; and Bright, Roy L., 4,954,030, Cl. 410-96.000.

Brisson, Bruce A. Audio signal transmission system with noise suppression network. 4,954,787, Cl. 330-149.000.

Bristol Babcock S.A.: *See*—
Ubanski, Patrick; and Smolders, Jo, 4,954,801, Cl. 336-90.000.

Bristol Corporation: *See*—
Vegso, Lajos, 4,953,584, Cl. 137-218.000.

Bristol-Myers Company: *See*—
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,954,507, Cl. 514-300.000.

Bristol-Myers Squibb Company: *See*—
Smith, David W.; Yocca, Frank D.; Yevich, Joseph P.; and Mattson, Ronald J., 4,954,502, Cl. 514-253.000.

Bristow, Donald: *See*—
Kuchta, Richard; Billings, Larry; Evenzon, Vladimir; and Bristow, Donald, 4,953,469, Cl. 104-127.000.

British Telecommunications plc: *See*—
Healey, Peter, 4,955,013, Cl. 370-1.000.

British Telecommunications public company limited: *See*—
Stentiford, Frederick W. M., 4,955,056, Cl. 381-43.000.

British Telecommunications public limited company: *See*—
Hill, Godfrey R.; Smith, David W.; and Hunkin, David J., 4,955,026, Cl. 372-18.000.

Bromley, Scott, to Scott Tech International, Inc. Internal cutting head for drifting pipe. 4,954,023, Cl. 408-1.00R.

Broszat, Lothar; Servos, Michael; and Schnitzler, Dieter, to TRW Ehrenreich GmbH & Co. KG. Adjustable fastening of a ball joint to a track rod for steering rods of motor vehicles. 4,953,894, Cl. 280-846.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Fukao, Hiroaki; Ohkita, Teruhiko; Nagasaka, Nobusuke; and Ueno, Tateo, 4,953,484, Cl. 112-162.000.
Yamakawa, Kiyoshi; Sugiura, Yoshio; and Tsuruki, Satoru, 4,954,956, Cl. 364-419.000.

Brothersen, Carl F.; and Knoespel, Willard R. W., to Miles Laboratories, Inc. Method for controlling the concurrent growth of two or more lactic acid producing bacteria. 4,954,450, Cl. 435-252.400.

Brower, David; and Jernigan, Thomas K., to TD Quilting Machinery. Automatic quilting machine and method for specialized quilting of patterns with separate computers to control the stitching and table movement functions. 4,953,483, Cl. 112-119.000.

Brower, David; and Jernigan, Thomas K., to TD Quilting Machinery. Automatic quilting machine for specialized quilting of patterns which can be created by utilizing computer graphics in conjunction with a reprogrammable computer. 4,953,485, Cl. 112-262.300.

Brown, Daniel E., Jr. Tire bead-breaker. 4,953,606, Cl. 157-1.170.

Brown, Kenneth R.: *See*—
Stiver, C. Edward; Teti, George J.; Pearson, Charles S.; and Brown, Kenneth R., 4,953,383, Cl. 72-402.000.

Brown, Martin A. Device for adhesively holding small objects. 4,953,902, Cl. 294-1.100.

Brown, R. Malcolm, Jr.; and Lin, Feng C., to Board of Regents, The University of Texas System. Multiribbon microbial cellulose. 4,954,439, Cl. 435-101.000.

Brown, Ronald E.; and Lee, Fu M. Extractive distillation of hydrocarbon feeds employing mixed solvent. 4,954,224, Cl. 203-51.000.

Brown, Steven R. Disposable wash mitt with detergent. 4,953,250, Cl. 15-104.940.

Brown, Vincent B.: *See*—
Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., 4,954,089, Cl. 439-76.000.

Bruggemeier, Fred H. Golf shoes and inserts for golf shoes. 4,953,311, Cl. 36-127.000.

Brunner, Matthias; and Lischke, Burkhard, to Siemens Aktiengesellschaft. Method for examining a specimen in a particle beam instrument. 4,954,705, Cl. 250-310.000.

Brunswick Corporation: *See*—
McMorries, Lee W., IV, 4,954,109, Cl. 440-78.000.

Brushwriter Corporation PTE Ltd.: *See*—
Chiu, Andrew, 4,954,955, Cl. 364-419.000.

Brussel, Richard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hydraulic press. 4,954,067, Cl. 425-406.000.

Brussel, Richard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hydraulic press. 4,954,068, Cl. 425-406.000.

Brust, Hans D., to Siemens Aktiengesellschaft. Voltage measurement with an electron probe without external trigger signal. 4,954,773, Cl. 324-158.00R.

Bryan, Robert M. Stacker device for a package. 4,953,702, Cl. 206-432.000.

Bryan, William T. Closure for a container. 4,953,781, Cl. 229-125.110.

Buck, Brian G.: *See*—
Fehr, William A.; and Buck, Brian G., 4,953,515, Cl. 123-526.000.

Buck, Daniel C., to Westinghouse Electric Corp. Movable optical fiber system for directing microwaves. 4,954,834, Cl. 342-360.000.

Buckley, William P.: *See*—
Hill, Edward W. D.; Buckley, William P.; and Hennessey, Robert, 4,954,086, Cl. 439-65.000.

Bugaut, Andree; and Junino, Alex, to L'Oreal. Substituted metaaminophenols, a process for their preparation, hair-dyeing compositions containing them and a hair-dyeing process. 4,954,131, Cl. 8-421.000.

Buhnen, Heinz D.: *See*—
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, 4,954,594, Cl. 526-320.000.

Buhrer, Carl F.; and Bellows, Alfred H., to GTE Laboratories Incorporated. Optical fiber expanded beam connector. 4,953,938, Cl. 350-96.180.

Buisson, Jean-Michel; and Soubrier, Jean-Marie, to Thomson-CSF. Control device for switched power supply. 4,954,767, Cl. 323-283.000.

Bull, Larry J.; Sieradzki, Raymond; and Olson, Kurt G., to PPG Industries, Inc. Water-based ink compositions. 4,954,556, Cl. 524-378.000.

Bullis, Robert H.; Swindal, James L.; Wiegand, Walter J., Jr.; Brahm, Charles B.; and Meyer, Harold D., to United Technologies Corporation. Capacitive sensor with minimized dielectric drift. 4,954,925, Cl. 361-283.000.

Bunge, David J., to Dow Corning Corporation. Silicone emulsions. 4,954,554, Cl. 528-388.000.

Bunnell, Stephen C.: *See*—
Lewis, Larry N.; and Bunnell, Stephen C., 4,954,549, Cl. 524-264.000.

Buonodono, Joseph B.: *See*—
Frye, Dale J.; Lindberg, Kenneth M.; Kindig, Alan L.; Stander, Robert J.; Buonodono, Joseph B.; Gras, Jeffrey D.; and Ozios, David A., 4,953,259, Cl. 16-225.000.

Buonomo, Franco: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,954,653, Cl. 564-223.000.

Burgoyne, William F., Jr.; Langsam, Michael; and Fowlkes, Robert L., to Air Products and Chemicals, Inc. Polyimide membranes and their use for gas separation. 4,954,144, Cl. 55-16.000.

Burk, Gary N.; McCanney, Thomas O.; and Williams, Paul, to Process Automation Business, Inc. Light guided illuminating/sectioning device for sheet inspection system. 4,954,891, Cl. 358-101.000.

Burk, John P.: *See*—
Fishman, Oleg; Prabhu, Satyen N.; Burk, John P.; and Tabatabaei, Emad, 4,953,761, Cl. 222-602.000.

Burkett, David: *See*—
Irvin, Ronald D.; Burkett, David; Kaplan, David E.; and Harvey, Ronald J., 4,954,046, Cl. 417-53.000.

Burkhalter, Robert E.: *See*—
Wallis, Philip; Burkhalter, Robert E.; and Hall, Thomas D., 4,954,002, Cl. 401-217.000.

Burndy Corporation: *See*—
Hill, Edward W. D.; Buckley, William P.; and Hennessey, Robert, 4,954,086, Cl. 439-65.000.

Burnett, David W. Shade attachment for eyeglasses. 4,953,231, Cl. 2-13.000.

Burns, Alan R., to Altrack Limited. Ground engaging surface for endless tracks, wheels and tires. 4,953,921, Cl. 305-35.0EB.

Burr-Brown Corporation: *See*—
Kalthoff, Timothy V., 4,954,769, Cl. 323-313.000.

Burroughs Wellcome Co.: *See*—
Jones, Harry P.; Mackey, Robert J.; and Gamlen, Michael J. D., 4,954,350, Cl. 424-493.000.

Burton, Robert L., to Boeing Company, The. Continuous flow hypersonic centrifugal wind tunnel. 4,953,397, Cl. 73-147.000.

Busak & Luyken GmbH & Co.: *See*—
Muller, Heinz K., 4,953,876, Cl. 277-165.000.

Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, to Rieter Machine Works Ltd. Method of mounting chuck structures. 4,953,802, Cl. 242-46.200.

Bush, Arden W.; and Shirley, Everett E., to Contacts, Metals and Welding, Inc. Resistance welding electrode and process. 4,954,687, Cl. 219-119.000.

Bush, Blaine A.: *See*—
Phillips, William R.; Bush, Blaine A.; O'Brien, John J.; and Thalken, Charles R., 4,953,610, Cl. 160-84.100.

Bush, Rodney D.: *See*—
Bissett, Donald L.; Bush, Rodney D.; and Chatterjee, Ranjit, 4,954,332, Cl. 424-59.000.

Bush, Steve, to VLSI Technology, Inc. Machine process for converting one representation of an electronic integrated circuit into another representation. 4,954,953, Cl. 364-578.000.

Bustamante, Joaquin: *See*—
Griffith, Glenn E.; Bustamante, Joaquin; Scheel, Michael D.; and Koven, Herbert, 4,953,777, Cl. 228-119.000.

Butcher, Kenneth R.; Doddato, Carmine M.; and Stough, Donna M., to Norton Company. Stone to finish stone washed jeans. 4,954,138, Cl. 51-293.000.

Butterworth, Robert M.; and Saunders, Keswyn D., to Lever Brothers Company. Fabric softening composition: fabric softener and hydrophobically modified nonionic cellulose ether. 4,954,270, Cl. 252-8.800.

Buyak, William P., to General Signal Corporation. Piezo electronic horn. 4,954,805, Cl. 340-384.00E.

C. R. Bard, Inc.: *See*—
Akerfeldt, Dan, 4,953,558, Cl. 128-751.000.

Cabasso, Israel; and Levy, Moshe, to Research Foundation of the State University of New York, The. Preparation of porous substrates having well defined morphology. 4,954,381, Cl. 428-116.000.

Cahill, Michael J.; and Dawson, John, to Molins plc. Rod monitoring device. 4,953,573, Cl. 131-280.000.

Caillat, Jean-Luc; and Seibel, Stephen M., to Copeland Corporation. Scroll compressor with lubricated flat driving surface. 4,954,057, Cl. 418-55.600.

Cailly, Francinet; and Fabre, Frederic, to Rhone-Poulenc Chimie. Separation of thorium and rare earth values from fluoride concentrates thereof. 4,954,293, Cl. 252-625.000.

Cain, Bertram J.; Devon, Wesley S.; and Patton, Ronald F., to Cole's Quality Foods, Inc. Movable display rack. 4,953,879, Cl. 280-47.190.

California Institute of Technology: *See*—
Maserjian, Joseph, 4,953,955, Cl. 350-354.000.
Woody, David P., 4,955,085, Cl. 455-330.000.

Callens, Roland; and Collin, Andre, to Solvay & Cie (Societe Anonyme). Use of guanidine-related compounds comprising a substituted tetraphenylborate ion in solution phase peptide synthesis. 4,954,616, Cl. 530-333.000.

Calmac Manufacturing Corp.: *See*—
MacCracken, Calvin D.; and Telkes, Maria, 4,954,278, Cl. 252-70.000.

Camex: *See*—
Campbell, Donald R., 4,955,002, Cl. 367-99.000.

Campbell, Donald R., to Camex. Vibratory, time variant, pseudorandom sonar system. 4,955,002, Cl. 367-99.000.

Campbell, Henry F.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Faith, William C., 4,954,494, Cl. 514-210.000.

Campbell, Monty A. Exhaust system. 4,953,352, Cl. 60-313.000.

Campo, Liborio. Method and a continuous cycle compactor-apparatus, including a circulating forced air pre-chamber for treating biodegradable solid urban waste materials and for separating and recycling the non-biodegradable components thereof. 4,953,457, Cl. 100-37.000.

Cancer Diagnostics, Inc.: *See*—
Guirguis, Raouf A., 4,953,561, Cl. 128-771.000.

Canon Kabushiki Kaisha: *See*—
Amada, Hiroshi; Aoike, Tatsuyuki; Yoshino, Takehito; and Okamura, Ryuji, 4,954,397, Cl. 430-58.000.
Azeta, Takahiro; Kameyama, Toru; Sekiya, Harukazu; Moritani, Toshifumi; Higeta, Akira; Baba, Kenji; Matoba, Takeshi; Goto, Shinji; and Kubota, Kazuyuki, 4,953,846, Cl. 271-251.000.
Baba, Hisatoshi, 4,955,011, Cl. 369-54.000.
Furutsu, Etsuro; and Izukawa, Kazuhiro, 4,954,741, Cl. 310-316.000.
Hara, Kazuhiko; Takahashi, Toshiaki; and Nagura, Masato, 4,953,405, Cl. 73-602.000.
Hasegawa, Kenji; Mori, Takahiro; and Higuma, Masahiko, 4,954,395, Cl. 428-318.400.
Hashizume, Junichiro; Takei, Tetsuya; Iida, Shigehira; Saitoh, Keishi; and Arai, Takayoshi, 4,953,498, Cl. 118-719.000.
Hirasawa, Masahide, 4,954,911, Cl. 358-323.000.
Inoue, Masahiro; Tajima, Hatsuo; Sakemi, Yuji; and Okado, Kenji, 4,954,404, Cl. 430-45.000.
Iwata, Koji; Okuma, Shigeru; Kimura, Yoshimasa; Konata, Yoshihiro; and Kaneko, Kiyoshi, 4,953,413, Cl. 74-1.0SS.
Izukawa, Kazuhiro, 4,954,742, Cl. 310-316.000.
Kajita, Koji, 4,954,913, Cl. 358-474.000.
Kanome, Osamu; and Tsutsumi, Takayoshi, 4,954,380, Cl. 428-64.000.
Ohtsuka, Naoji, 4,954,800, Cl. 335-284.000.
Ohzu, Hayao, 4,954,703, Cl. 250-208.100.
Shirasaka, Akifumi; Seto, Kunio; Hamada, Masaki; and Shibuya, Yukari, 4,955,064, Cl. 382-22.000.
Suzuki, Hidetoshi; and Nomura, Ichiro, 4,954,744, Cl. 313-336.000.
Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 4,954,701, Cl. 250-201.800.
Takahashi, Hiroshi, 4,954,967, Cl. 364-518.000.
Takahashi, Hiroshi, 4,955,081, Cl. 455-608.000.
Terui, Hiroshi, 4,955,062, Cl. 382-8.000.
Ueno, Yasuhide, 4,954,910, Cl. 358-296.000.
Yano, Kanji; Saijo, Yasutsugu; Kusaka, Kensaku; and Hirabayashi, Hiromitsu, 4,954,845, Cl. 355-290.000.

Cappellazzo, Oscar: *See*—
Messina, Giuseppe; Nurra, Carmelo; Cappellazzo, Oscar; Virdis, Angelo; and Lorenzoni, Loreno, 4,954,660, Cl. 568-697.000.

Capra, Pier C.: *See*—
Lupo, Giorgio; and Capra, Pier C., 4,953,881, Cl. 280-91.000.

Carduck, Franz-Josef; Falbe, Juergen; Fleckenstein, Theo; Goebel, Gerd; and Pohl, Joachim, to Henkel Kommanditgesellschaft auf Aktien. Process for the direct hydrogenation of butterfat. 4,954,664, Cl. 568-864.000.

Carey, John G.: *See*—
Winterton, Neil; and Carey, John G., 4,954,287, Cl. 252-182.260.

Carl Freudenberg, Firma: *See*—
Beicht, Bernd; Tinz, Reinhard; and Heinemann, Joachim, 4,953,514, Cl. 123-520.000.

Carl-Zeiss-Stiftung: *See*—
Esswein, Karlheinz; and Kummer, Ludwig, 4,953,962, Cl. 350-507.000.

Carlin, Paul J. Tree felling spotter. 4,953,303, Cl. 33-284.000.

Carlini, Filippo M.: *See*—
Bornengo, Giorgio; Carlini, Filippo M.; Pontevivo, Michele; and Bottaccio, Giorgio, 4,954,643, Cl. 549-531.000.

Carlson, Bruce M. Clean room enclosure. 4,953,333, Cl. 52-281.000.

Carminati, Paolo: *See*—
Alpegiani, Marco; Perrone, Ettore; Orezzi, Piergiuseppe; Carminati, Paolo; and Cassinelli, Giuseppe, 4,954,493, Cl. 514-195.000.

Carpenter, David J. Liquid prism device. 4,953,956, Cl. 350-419.000.

Carpenter, Robert B.: *See*—
Bloys, J. Benjamin; Carpenter, Robert B.; and Wilson, William N., 4,953,620, Cl. 166-293.000.

Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, to International Business Machines Corporation. Method of chemical-mechanical polishing an electronic component substrate and polishing slurry therefor. 4,954,142, Cl. 51-309.000.

Carrechio, Pierre: *See*—
Comparat, Vincent; Ballos, Jean; Carrechio, Pierre; and Pelissier, Alain, 4,954,710, Cl. 250-385.100.

Carrier Corporation: *See*—
Boah, John K.; Cooney, Charles T., Jr.; Schoch, Stephen A.; and Sibley, Howard W., 4,953,511, Cl. 122-18.000.

Carter, John L.; Sprague, Michael M.; Stone, Crosby; and Felsheim, James A., to Wagner Electronic Products, Inc. Kiln controller. 4,953,298, Cl. 34-44.000.

Carter, Simon T.: *See*—
Right, Robert W.; and Carter, Simon T., 4,954,809, Cl. 340-516.000.

Casals-Stenzel, Jorge: *See*—
Skuballa, Werner; Radusechel, Bernd; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Mannesmann, Gerda; Schillinger, Ekkehard; and Town, Michael H., 4,954,524, Cl. 514-530.000.

Casavant, Terry S.: *See*—
Becker, Thomas K.; Casavant, Terry S.; Helm, P. Ralph; Petzold, Terry L.; Wanek, Michael J.; and Zuehlke, Art G, 4,953,722, Cl. 212-156.000.

Case, Andrew B.: *See*—
Crnojevich, Ranko; Wiewiorowski, Edward I.; and Case, Andrew B., 4,954,168, Cl. 423-55.000.

Cash, Howard A.: *See*—
Johal, Sarjit S.; and Cash, Howard A., 4,954,440, Cl. 435-101.000.

Cassinelli, Giuseppe: *See*—
Alpegiani, Marco; Perrone, Ettore; Orezzi, Piergiuseppe; Carminati, Paolo; and Cassinelli, Giuseppe, 4,954,493, Cl. 514-195.000.

Castiglioni, Antonio, to Civiemme S.r.l. Device for handling and guiding bundles with vertical sheet stackers. 4,953,845, Cl. 271-217.000.

Caton, Dennis W., to Penford Products Co. Starch hydrolyzate product. 4,954,178, Cl. 127-32.000.

Cavalleri, Bruno: *See*—
Malabarba, Adriano; Strazzolini, Paolo; Trani, Aldo; Magni, Ambrogio; and Cavalleri, Bruno, 4,954,483, Cl. 514-9.000.

Cavezzan, Jacques; and Peignier, Michel, to Rhone-Poulenc Chimie. Aqueous silicone emulsions containing tin monochelate crosslinking catalysts. 4,954,539, Cl. 524-27.000.

Cebal: *See*—
Delespaul, Frederic; and Schneider, Bernard, 4,954,191, Cl. 156-69.000.

Celli, Giuliano. Boot support. 4,953,715, Cl. 211-37.000.

Central Glass Company, Limited: *See*—
Shinnai, Masao; Nishikawa, Kazuya; Tsukada, Tokio; and Hirotsu, Tohru, 4,954,797, Cl. 343-704.000.
Sugawara, Kiyomi; Tsutsumi, Kentaro; and Otani, Mikio, 4,954,589, Cl. 526-255.000.

Centre National de la Recerche Scientifique - Cnrs: *See*—
Alexandre, Stephane; Thellier, Michel; and Vincent, Jean-Claude, 4,954,261, Cl. 210-638.000.

Centre National de la Recherche Scientifique: *See*—
Comparat, Vincent; Ballon, Jean; Carrechio, Pierre; and Pelissier, Alain, 4,954,710, Cl. 250-385.100.
Centre National d'Etudes des Telecommunications: *See*—
Menigaux, Louis; and Dugrand, Louis, 4,955,030, Cl. 372-44.000.
Ceradyne, Inc.: *See*—
Kelly, John S.; and Gille, Henrick K., 4,954,080, Cl. 433-8.000.
Cerutti, David B., to General Electric Company, The. Method for producing polycrystalline compact tool blanks with flat carbide support/diamond or CBN interfaces. 4,954,139, Cl. 51-293.000.
Cetus Corporation: *See*—
Nitecki, Danute E.; and Aldwin, Lois, 4,954,637, Cl. 548-546.000.
Chai, Sang Hun: *See*—
Kim, Kwang S.; Chai, Sang Hun; Koo, Young S.; Kim, Yeo H.; and Lee, Jin H., 4,954,456, Cl. 437-31.000.
Chamberlain, David: *See*—
Norman, Richard; Norman, Sonja; and Chamberlain, David, 4,953,870, Cl. 273-241.000.
Chamberlain, Neal C.: *See*—
Becicka, Kenneth F.; and Chamberlain, Neal C., 4,954,042, Cl. 414-718.000.
Chambers, Gregory R.: *See*—
Bennett, James G., Jr.; and Chambers, Gregory R., 4,954,475, Cl. 502-343.000.
Chambers, John D. Mailbox signal device. 4,953,783, Cl. 232-35.000.
Champonnois, Francois; David, Bernard; and Joffre, Francis, to Commissariat a l'Energie Atomique. Eddy current testing system using two samples with different time lags. 4,954,778, Cl. 324-233.000.
Chan, Winston K., to Bell Communications Research Inc. Schottky barrier on indium gallium arsenide. 4,954,851, Cl. 357-15.000.
Chandaria, Ashok K., to Conros Corporation. Modified adhesive composition which undergoes color changes upon application. 4,954,544, Cl. 524-111.000.
Chandler, Bill B.; and Olson, Ramona Z. Plug in power converter structure. 4,954,940, Cl. 363-146.000.
Chang, C. C. Safety dress fastener. 4,953,268, Cl. 24-694.000.
Chang, Chung-Nan; Conlon, William M.; and Hendricks, Donald M., to Polar Spring Corporation. Method and means for optimizing batch crystallization for purifying water. 4,954,151, Cl. 62-532.000.
Chang, Tallis Y.: *See*—
Ewbank, Mark D.; Chang, Tallis Y.; and Feinberg, Jack L., 4,953,954, Cl. 350-354.000.
Chapman, Emmett H. Rear-access trussed neck construction for stringed musical instruments. 4,953,435, Cl. 84-293.000.
Chapman, William L.; Marner, Charles F.; Schotter, Daniel K.; and Hehn, Ronald L., to Hughes Aircraft Company. Compound angle limiting device. 4,953,422, Cl. 74-526.000.
Charles Machine Works, Inc., The: *See*—
Dunn, Richard P., 4,953,638, Cl. 175-61.000.
Chatigny, Joseph V.; and Smith, Peter R., to Pennwalt Corporation. Penetration sensor. 4,954,811, Cl. 340-550.000.
Chatterjee, Ranjit: *See*—
Bissett, Donald L.; Bush, Rodney D.; and Chatterjee, Ranjit, 4,954,332, Cl. 424-59.000.
Chatzis, Ioannis: *See*—
Dullien, Francis A.; Chatzis, Ioannis; and Macdonald, Ian F., 4,953,619, Cl. 166-265.000.
Chau, Tommy L.: *See*—
Cherukuri, Subraman R.; Mansukhani, Gul; and Chau, Tommy L., 4,954,353, Cl. 426-5.000.
Chayka, Stanley J.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,954,883, Cl. 358-22.000.
Chemelewski, Tad M., to Dana Corporation. Vehicle wheel speed sensor. 4,953,670, Cl. 188-181.00A.
Chemetron-Railway Products, Inc.: *See*—
Fee, Graham M., 4,953,787, Cl. 238-349.000.
Chemex Pharmaceuticals, Inc.: *See*—
Parkhurst, Robert M.; and Pardini, Ronald S., 4,954,659, Cl. 568-651.000.
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Thomassen, Thomas, 4,954,228, Cl. 204-105.00R.
Cheminvest A.S.: *See*—
Thomassen, Thomas, 4,954,234, Cl. 204-212.000.
Chen, Chung-Mei; Yang, Jenn Fu; Lee, Weng-Jay; Lin, Tsai-Sheng; and Tsay, Yung-Hsing, to China Steel Corporation. Automated apparatus for inspecting columnar bodies by eddy current method. 4,953,710, Cl. 209-518.000.
Chen, Jen; and Hutchison, Alan J., to Ciba-Geigy Corporation. N9-cyclopentyl-substituted adenine derivatives having adenosine-2 receptor stimulating activity. 4,954,504, Cl. 514-265.000.
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Grimshaw, Michael N., 4,954,204, Cl. 156-361.000.
Leary, Lynn; and Schumann, Ronald C., 4,954,066, Cl. 425-388.000.
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Clum Manufacturing Company, Inc.: *See*—
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Nieman, Gerald R.; Clyatt, Clarence L., III; Paulus, Eric J.; Zehrung, Scott A.; Ragl, Albert; and Moore, John R., 4,954,794, Cl. 333-182.000.

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Coesen, Karl; Flanhardt, Michael; and Langen, Hans-Jurgen, to Jean Walterscheid GmbH. Angular bevel gear drive for agricultural implements. 4,953,611, Cl. 73-862.330.

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Cogan, Kenneth L. Cable employing tubular conductors. 4,954,095, Cl. 439-284.000.

Cohen, Abraham. Telescoping display device. 4,953,905, Cl. 294-19.100.

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Halilden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 4,954,574, Cl. 525-327.600.

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Cohodar, Alija. Mini-office facility. 4,953,327, Cl. 52-36.000.

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Coleman, Charles R.; Wolfe, Terry L.; Winter, John A.; and Fiano, Elizabeth A., to PPG Industries, Inc. Processing glass sheets with ceramic enamel bands. 4,954,153, Cl. 65-60.530.

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Cain, Bertram J.; Devon, Wesley S.; and Patton, Ronald F., 4,953,879, Cl. 280-47.190.

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Collette, Wayne N.: *See*—
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Takahashi, Takehiko; and Kato, Hitoshi, 4,953,887, Cl. 280-647.000.

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McDonald, Francis X.; Weisel, Eric M.; and Schukei, Glen E., 4,954,312, Cl. 376-260.000.

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Connelly, Thomas R. Method and apparatus for staking articles to a ground surface. 4,953,576, Cl. 135-118.000.

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Bush, Arden W.; and Shirley, Everett E., 4,954,687, Cl. 219-119.000.

Contant, Bernard. Holder for beverage boxes. 4,953,818, Cl. 248-222.300.

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Krishnakumar, Suppayan M.; Nahill, Thomas E.; Schmidt, Steven L.; and Collette, Wayne N., 4,954,376, Cl. 428-35.700.

Contraves AG: *See*—
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Albrecht, Charles W., 4,953,831, Cl. 261-102.000.

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Boah, John K.; Cooney, Charles T., Jr.; Schoch, Stephen A.; and Sibley, Howard W., 4,953,511, Cl. 122-18.000.

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Cooper, Paul V. Dispersing gas into molten metal. 4,954,167, Cl. 75-708.000.

Cooper, Peter D., to Australian National University, The. Pharmaceutical composition and method containing gamma inulin or derivative thereof. 4,954,622, Cl. 536-127.000.

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Caillat, Jean-Luc; and Seibel, Stephen M., 4,954,057, Cl. 418-55.600.

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Hanagan, Michael W., 4,953,911, Cl. 297-195.000.

Corning Incorporated: *See*—
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Cornwall, Kenneth R. Trap fitting assembly. 4,953,235, Cl. 4-191.000.

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Coronet-Werke Heinrich Schierf GmbH: *See*—
Weihrauch, Georg, 4,954,305, Cl. 264-157.000.

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Cortese, Alfred J. Plastic trash bag. 4,953,704, Cl. 206-493.000.
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Boinot, Francois; Cousin, Michel; Hochin, Andre ; and Meyer, Nicolas, 4,954,394, Cl. 428-289.000.
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CoWorks: *See*—
Dehner, Charles V., Jr.; and Kihm, Theodore E., 4,954,981, Cl. 364-900.000.
Crabtree, Michael L., to Gates Rubber Company, The. Method for making an airspring and sleeve. 4,954,194, Cl. 156-175.000.
Craig, Chester L., Jr. Transmission apparatus for bicycle or like pedal-operated vehicle. 4,953,882, Cl. 280-258.000.
Crane, Roger M.: *See*—
Fischer, Eugene C.; and Crane, Roger M., 4,954,377, Cl. 428-36.100.
Crane, Timothy N. F. Vehicle hood protector with specialized attaching apparatus. 4,953,909, Cl. 296-136.000.
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Crawford, Joseph A., to North American Philips Corporation. Fluorescent lamp electrode disconnect method and arrangement for practicing the method. 4,954,749, Cl. 315-97.000.
Craycraft, Michael R., to Perfecto Industries, Inc. Apparatus for supplying a sheet metal strip to a press. 4,953,808, Cl. 242-78.600.
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Creazzo, Joseph A.: *See*—
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Creissels, Denis, to Pomagalski S.A. Large span gondola lift. 4,953,468, Cl. 104-123.000.
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Crowe, Lawrence E.; and Sutrina, Thomas A., to Sundstrand Corporation. Hermetically sealed compression bonded circuit assembly having flexible walls at points of application of pressure for compression bonding circuit elements. 4,954,876, Cl. 357-76.000.
Cruickshank, Thomas R. Headgear camera mount. 4,953,766, Cl. 224-181.000.
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Cunningham, Sinclair: *See*—
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Curletto, Giorgio F. Folding housing for electronic M.I.D.I. accordion. 4,953,436, Cl. 84-376.00A.
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Tisbo, Cosmo N.; and Mack, Robert J., 4,953,735, Cl. 220-6.000.
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Champonnois, Francois; David, Bernard; and Joffre, Francis, 4,954,778, Cl. 324-233.000.
David, Lawrence D.: *See*—
Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, 4,954,142, Cl. 51-309.000.
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, to SSMC Inc. Steam ironing press. 4,953,300, Cl. 38-36.000.
Davidson, Robert: *See*—
Tonn, Howard E.; Davidson, Robert; Shultz, David B.; and Miller, Keith R., 4,953,727, Cl. 213-8.000.
Davis, Dale C. Adjustable support clamp apparatus and method. 4,953,819, Cl. 248-230.000.
Davis, George T.: *See*—
DeReggi, Aime S.; Chiang, Chwan-Kang; and Davis, George T., 4,954,481, Cl. 505-1.000.
Davis, Larry: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,954,511, Cl. 514-327.000.
Davis, Paul D.; Schuster, Gary B.; Truini, Jacqueline G.; and Fentiman, Al, to Mead Corporation, The. Photoinitiator compositions containing O-acylthiohydroxamate or an N-alkoxypyridinethione and photohardenable compositions containing the same. 4,954,415, Cl. 430-138.000.
Davis, Robert L.; and Keith, Harold D., to University of Missouri, The Curators of the. Expansion bolt and mine roof reinforcement. 4,954,017, Cl. 405-259.000.
Dawson, John: *See*—
Cahill, Michael J.; and Dawson, John, 4,953,573, Cl. 131-280.000.
Dawson, Thomas M.: *See*—
Morganstein, Sanford J.; Bindl, Ron H.; Klecka, Mark D.; Krakau, Herbert B.; and Dawson, Thomas M., 4,955,047, Cl. 379-112.000.
Day, Charles L. Multi-actuator hydraulic press. 4,953,458, Cl. 100-269.00R.

Dayco Products, Inc.: *See—*
Stiver, C. Edward; Teti, George J.; Pearson, Charles S.; and Brown, Kenneth R., 4,953,383, Cl. 72-402.000.
Deaver, Gerald A.: *See—*
Dixon, Robert C.; Deaver, Gerald A.; Punches, James R.; Singleton, Guy E.; Erbes, John G.; and Offer, Henry P., 4,954,311, Cl. 376-258.000.
Debus, Jurgen: *See—*
Reuter, Wolfgang; Debus, Jurgen; and Lehr, Lothar, 4,953,821, Cl. 248-276.000.
Dechow, Frederick J.: *See—*
Sheth, Pravin B.; and Dechow, Frederick J., 4,954,349, Cl. 424-461.000.
DeDino, Jeffery L., to Shelby Paper Box Company, The. Display card for a battery package. 4,953,700, Cl. 206-333.000.
Deeg, Helmut: *See—*
Alberter, Gunther; Deeg, Helmut; Hettich, Gerhard; Neidhard, Klaus; Schmid, Hans-Dieter; and Schrumpf, Hans, 4,954,677, Cl. 200-834.000.
Deeg, Martin H. G., to Hoechst Celanese Corp. Aromatic polyetherketone fiber product. 4,954,605, Cl. 528-125.000.
Deere & Company: *See—*
Revankar, Gopal S., 4,954,058, Cl. 419-18.000.
Degen, Peter J.; Rothman, Isaac; and Gsell, Thomas C., to Pall Corporation. Hydrophobic membranes. 4,954,256, Cl. 210-490.000.
De Gouville, Jean-Bernard L.; and Dane, Bernard, to Sourdillon-Airindex. Gas burner assembly of extra flat type. 4,953,534, Cl. 126-39.00H.
Deguchi, Koji: *See—*
Abe, Tadashi; Manabe, Mitsuyoshi; Deguchi, Koji; Uhara, Hiroyuki; and Aoki, Yukio, 4,954,650, Cl. 562-534.000.
Deguchi, Toshihisa: *See—*
Fuji, Hiroshi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; Terashima, Shigeo; and Fujiwara, Tsuneo, 4,954,903, Cl. 360-46.000.
Degussa Aktiengesellschaft: *See—*
Panster, Peter; and Kleinschmit, Peter, 4,954,599, Cl. 528-38.000.
Dehner, Charles V., Jr.; and Kihm, Theodore E., to CoWorks. Method and apparatus for accessing and manipulating time series. 4,954,981, Cl. 364-900.000.
De Hoff, Ronald L. Process for curing epoxy resin anhydride blends at moderately elevated temperatures. 4,954,196, Cl. 156-169.000.
Delespaul, Frederic; and Schneider, Bernard, to Cebal. Pack comprising a tube, a screw cap and a cover to weld over the neck of the tube, and a method of sealing said tube. 4,954,191, Cl. 156-69.000.
Delhar Industries, Inc.: *See—*
Hurworth, Samuel G., 4,953,625, Cl. 172-305.000.
Delmonte, Jeffrey C. Head positioning system. 4,954,815, Cl. 340-686.000.
Delony, Timothy E.: *See—*
Kushner, Gregory; and Delony, Timothy E., 4,954,236, Cl. 204-299.00R.
Delsey S.A.: *See—*
Seynhaeve: Andre G., 4,953,257, Cl. 16-45.000.
DeMarthe, Jean-Michel, to Metaleurop S.A. Process for the recovery of metal values contained in a gangue. 4,954,322, Cl. 423-95.000.
DeMarzo, Arthur P. Blood glucose monitoring system. 4,953,552, Cl. 128-635.000.
Demetrious, Gregory: *See—*
Savage, Charles; Barone, Frank G., Jr.; Demetrious, Gregory; and Volpe, Vincent, 4,954,958, Cl. 364-444.000.
De Muro, David M.: *See—*
Green, Steven R.; De Muro, David M.; Moutrie, Michael F.; Sokola, Raymond L.; and Gordon, Phillip J., 4,954,796, Cl. 333-206.000.
Den Hartog, Herman C.; Konsza, Eileen E.; Matthews, James F.; and Werner, Ervin R., Jr., to Du Pont de Nemours, E. I., and Company. Waterbased methylol (meth) acrylamide acrylic polymer and polyurethane containing coating composition. 4,954,559, Cl. 524-507.000.
Denis, Richard A.; and Koch, Frederick W., to Lubrizol Corporation, The. Oil formulations containing overbased multi-functional additive. 4,954,273, Cl. 252-39.000.
Dennison, Richard L., to Minnesota Mining and Manufacturing Company. Automated thermoplastic dispensing device. 4,953,755, Cl. 222-146.500.
Densen, Mark S. Reversible foldable container and closure therefor. 4,953,779, Cl. 229-23.00R.
DePaul, Alice A.: *See—*
McGlothlin, Mark W.; and DePaul, Alice A., 4,954,309, Cl. 264-307.000.
DeReggi, Aime S.; Chiang, Chwan-Kang; and Davis, George T., to United States of America, Commerce. Superconductor-polymer composites. 4,954,481, Cl. 505-1.000.
Desdouits, Jacques: *See—*
Poulain, Jean; and Desdouits, Jacques, 4,953,355, Cl. 60-663.000.
Deslandes, Yves: *See—*
Breton, Marcel P.; Deslandes, Yves; and Sacripante, Guerino, 4,954,412, Cl. 430-137.000.
Desmond, John W. Dispenser for rolled pressure sensitive labels. 4,954,210, Cl. 156-584.000.
Desmurs, Jean-Roger; Besson, Bernard; and Jouve, Isabelle, to Rhone-Poulenc Chimie. Selective chlorination of ortho-substituted phenols. 4,954,662, Cl. 568-779.000.
Desorcie, James L.: *See—*
Stein, Judith; Leonard, Tracey M.; and Desorcie, James L., 4,954,364, Cl. 427-54.100.
Detroit Diesel Corporation: *See—*
Kennedy, Lawrence C., 4,953,582, Cl. 137-115.000.
Deutsche Babcock Werke Aktiengesellschaft: *See—*
Kiefer, Dieter; and Grommes, Helmut, 4,953,793, Cl. 241-119.000.
Klein, Manfred, 4,953,509, Cl. 122-6.00A.
Deutsche Forschungs -und Versuchsanstalt fuer Luft- und Raumfanrt eV.: *See—*
Gekat, Frank, 4,955,035, Cl. 372-69.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Schabert, Hans-Peter; Strickroth, Erich; and Laurer, Erwin, 4,953,580, Cl. 285-23.000.
Develco, Inc.: *See—*
Borden, Louis H.; and Moore, T. Charles, 4,953,616, Cl. 166-66.400.
DeVictor, Pierre: *See—*
Gimeno, Rene ; Huc, Alain; and DeVictor, Pierre, 4,953,299, Cl. 34-92.000.
DeVoe, Robert J.: *See—*
Wright, Bradford B.; and DeVoe, Robert J., 4,954,416, Cl. 430-281.000.
DeVolk, Burton; Allen, Fritz; Newman, Cathy D.; and Fraatz, Robert J., to Mesa Diagnostics, Inc. Particle identifying apparatus. 4,953,980, Cl. 356-338.000.
Devon, Wesley S.: *See—*
Cain, Bertram J.; Devon, Wesley S.; and Patton, Ronald F., 4,953,879, Cl. 280-47.190.
DeVries, Robert C.: *See—*
Anthony, Thomas R.; DeVries, Robert C.; Engler, Richard A.; Ettinger, Robert H.; and Fleischer, James F., 4,953,499, Cl. 118-724.000.
DeWitte, Marc, to N.V. Bekaert S.A. Lead heat treatment of wire with prevention of lead entrainment. 4,954,183, Cl. 148-15.000.
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., to International Business Machines Corporation. Wordline voltage boosting circuits for complementary MOSFET dynamic memories. 4,954,731, Cl. 307-482.000.
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky Chau-Chun, to International Business Machines Corporation. Cross-point lightly-doped drain-source trench transistor and fabrication process therefor. 4,954,854, Cl. 357-23.400.
Diard, Jean-Luc; and Guers, Francois, to Salomon S.A. Ski having a variable width upper surface. 4,953,884, Cl. 280-609.000.
Di Cesare, Pierre: *See—*
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,954,507, Cl. 514-300.000.
Dickau, Ewald F.: *See—*
Breault, John P.; and Dickau, Ewald F., 4,953,756, Cl. 222-309.000.
Dicke, Grant D.; and Williams, Jeffrey A. Quick release mechanism and supporting device having a quick release mechanism. 4,954,008, Cl. 403-24.000.
Dicke, Hans-Rudolf; Genz, Joachim; Eckhardt, Volker; and Bottenbruch, Ludwig, to Bayer Aktiengesellschaft. Solid phase post polymerization condensation of thermotropic polyester imides. 4,954,606, Cl. 528-170.000.
Dicke, Hans-Rudolf: *See—*
Genz, Joachim; Dicke, Hans-Rudolf; Eckhardt, Volker; and Kleiner, Frank, 4,954,604, Cl. 528-125.000.
Dickens, Luther L., to RADVA Corporation. Economy building panel. 4,953,334, Cl. 52-309.400.
Dickhudt, Eugene A.: *See—*
Ray, Charles D.; and Dickhudt, Eugene A., 4,953,540, Cl. 128-20.000.
Diebold, Incorporated: *See—*
Wheelock, Norman R., 4,953,748, Cl. 221-59.000.
Diehl GmbH & Co.: *See—*
Engel, Michael; Pepping, Karl-Heinz; and Gebhardt, Gunther, 4,953,421, Cl. 74-523.000.
Gaag, Norbert; and Ruchel, Peter, 4,954,187, Cl. 148-413.000.
Postler, Gunter; Bock, Erich; von Entress-Furstenecк, Wolfgang; and Rudenauer, Werner, 4,953,813, Cl. 244-147.000.
Diehl, Markus: *See—*
Motz, Karl; and Diehl, Markus, 4,953,351, Cl. 60-285.000.
Diesel Kiki Co., Ltd.: *See—*
Iida, Katsumi, 4,953,630, Cl. 165-17.000.
Nakamura, Hisashi, 4,953,589, Cl. 137-543.230.
Dieulesaint, Eugene J.; Royer, Daniel R.; and Legras, Olivier R., to Materiel et Auxiliare de Signalisation et de Controle pour l'Automation. Sensor device using lamb elastic waves for detecting the presence of a liquid at a predetermined level. 4,954,997, Cl. 367-13.000.
Digital Equipment Corp.: *See—*
Fox, Leslie R.; Wade, Paul C.; and Schmidt, William L., 4,954,878, Cl. 357-81.000.
Lee, James; Beck, Richard; Lee, Chune; and Hu, Edward, 4,954,873, Cl. 357-72.000.
Leis, Michael; Engelson, Gary S.; and Lawrence, Bruce J., 4,954,788, Cl. 331-16.000.
Natusch, Paul J.; Yu, Eugene L.; Senerchia, David C.; and Henry, John F., Jr., deceased, 4,954,946, Cl. 364-200.000.
Ulichney, Robert A., 4,955,065, Cl. 382-50.000.
Digital Instruments, Inc.: *See—*
Elings, Virgil B.; and Maivald, Peter, 4,954,704, Cl. 250-307.000.
DiNovi, Michael J.: *See—*
Friedman, Mark I.; Tordoff, Michael G.; DiNovi, Michael J.; and Rafka, Robert J., 4,954,531, Cl. 514-738.000.

Dioszegine, Erzsebet E.: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.

Dipert, Dwight D.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norrworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,955,024, Cl. 371-40.100.

Diversified Fastening Systems, Inc.: *See*—
Crawford, Danny E.; and Rogge, Doug, 4,954,025, Cl. 408-238.000.

Dixon, Robert C.; Deaver, Gerald A.; Punches, James R.; Singleton, Guy E.; Erbes, John G.; and Offer, Henry P., to General Electric Company. Control rod housing alignment. 4,954,311, Cl. 376-258.000.

Djuric, Stevan W.; and Penning, Thomas D., to G. D. Searle & Co. 1,3-dioxolane derivatives useful in the treatment of inflammation. 4,954,520, Cl. 514-467.000.

Dobbs, Howard L., Jr. Replaceable saw blade and guide. 4,953,301, Cl. 30-392.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Ziegler, Hermann; Handte, Horst; Braun, Walter; and Gutzeit, Horst, 4,953,331, Cl. 52-208.000.

Dr. Lo. Zambeletti S.p.A.: *See*—
Vecchietti, Vittorio; and Giardina, Giuseppe, 4,954,509, Cl. 514-307.000.

Dodd, Thomas E.: *See*—
Fecher, Douglas A.; and Dodd, Thomas E., 4,953,446, Cl. 91-369.300.

Doddato, Carmine M.: *See*—
Butcher, Kenneth R.; Doddato, Carmine M.; and Stough, Donna M., 4,954,138, Cl. 51-293.000.

Dohse, Hans-Peter, to Andreas Stihl. Portable handheld tool having a drive shaft rotatably journalled in a protective tube. 4,953,294, Cl. 30-276.000.

Doi, Tetsuo; and Funabashi, Takeshi, to Sony Corporation. Method and apparatus for processing an image signal. 4,955,061, Cl. 382-56.000.

Dolan, Donald T.: *See*—
Tolmie, Robert J., Jr.; and Dolan, Donald T., 4,953,842, Cl. 271-2.000.

Dondlinger, Jerry A. Louvered headache rack. 4,953,908, Cl. 296-97.400.

Donohue, Patrick T. Punching bag and support. 4,953,852, Cl. 272-78.000.

Dorai, Suriyanarayanan; and Ernst, Richard E., to Du Pont de Nemours, E. I., and Company. Process for reducing fluoride levels in poly(tetramethylene ether) glycol. 4,954,658, Cl. 568-617.000.

Dormish, Jeffrey F.: *See*—
Rains, Randall C.; Dormish, Jeffrey F.; Stanton, Susan A.; and Rieck, James N., 4,954,199, Cl. 156-331.700.

Dornier System GmbH: *See*—
Kirch, Rudolf, 4,954,230, Cl. 204-149.000.

Dorrian, John F.: *See*—
Insetta, Victor D.; Monsorno, Richard V.; and Dorrian, John F., 4,953,273, Cl. 29-25.420.

Dosaka, Katsumi: *See*—
Kumanoya, Masaki; Shinohara, Hirofumi; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Yamasaki, Hiroyuki, 4,954,992, Cl. 365-207.000.

Doteuchi, Masami: *See*—
Kita, Toru; Narumiya, Shuh; Narisada, Masayuki; Watanabe, Fumrhio; Doteuchi, Masami; and Mizui, Takuji, 4,954,514, Cl. 514-381.000.

Dotson, Jimmy R., to Vandigriff, John E. Glass repair method and apparatus. 4,954,300, Cl. 264-36.000.

Dougherty, James A.: *See*—
Vara, Fulvio J.; Dougherty, James A.; and Plotkin, Jeffrey S., 4,954,593, Cl. 526-270.000.

Dow Chemical Company, The: *See*—
Erickson, Laurence R.; Behr, R. Douglas; and Vrooman, Roger D., 4,954,124, Cl. 493-195.000.
Kleschik, William A.; Ehr, Robert J.; Costales, Mark J.; Gerwick, Ben C., III; Meikle, Richard W., deceased; Monte, William T.; and Pearson, Norman R., 4,954,163, Cl. 71-92.000.
Moore, Eugene R.; and Wessel, Tom E., 4,954,303, Cl. 264-101.000.
Thill, Bruce P.; and King, Bruce A., 4,954,579, Cl. 525-467.000.

Dow Corning Corporation: *See*—
Bunge, David J., 4,954,554, Cl. 528-388.000.
King, Russell K., 4,954,601, Cl. 528-45.000.
Liles, Donald T., 4,954,565, Cl. 524-860.000.
Lo, Peter Y. K.; and Revis, Anthony, 4,954,269, Cl. 252-86.000.
Revis, Anthony, 4,954,401, Cl. 428-412.000.
Revis, Anthony, 4,954,597, Cl. 528-15.000.
Ward, Andrew H., 4,954,333, Cl. 424-66.000.

Draebel, Jorgen, to Span Tech Corporation. Modular link conveyor system. 4,953,693, Cl. 198-853.000.

Dragerwerk Aktiengesellschaft: *See*—
Mattheissen, Hans, 4,954,718, Cl. 250-493.100.

Drambarean, Viorel: *See*—
Wasserstrom, Henry; and Drambarean, Viorel, 4,954,802, Cl. 337-380.000.

Dresser Industries, Inc.: *See*—
Knauss, Richard J., 4,954,463, Cl. 501-120.000.

Dreyfus, Larry M.: *See*—
Tomaka, Leonard P.; and Dreyfus, Larry M., 4,953,473, Cl. 108-132.000.

Driessen, Leonardus M. H. E.; and Janse, Cornelis P., to U.S. Philips Corporation. Method and apparatus for storing digital data representing a topological network. 4,954,986, Cl. 365-189.010.

Drivon, Gilles: *See*—
Correia, Yves; Drivon, Gilles; and Lesparre, Jean, 4,954,231, Cl. 204-157.600.

Drushel, Ronald H.: *See*—
Futch, Max G.; and Drushel, Ronald H., 4,954,760, Cl. 318-480.000.

Du Pont Canada, Inc.: *See*—
Marchildon, Ernest K. A.; Muzyka, Douglas W.; and Dumoulin, Michel M., 4,954,302, Cl. 264-40.100.

Dubner, Joseph: *See*—
Sims, Louis; LeFriec, Fred; Dubner, Joseph; and Peavey, Brian, 4,953,995, Cl. 400-121.000.

Dubots, Patrick; and Legat, Denis, to Societe Anonyme dite:Alsthom. Composite superconducting strand having a high critical temperature, and method of manufacture. 4,954,479, Cl. 505-1.000.

Dubreuille, Ursule, legal representative: *See*—
Daleus, Camille, deceased; Dubreuille, Ursule, legal representative; and Daleus, Regine, legal representative, 4,954,117, Cl. 446-280.000.

Duerkob, Dorothy I.: *See*—
Duerkob, Manfred F., 4,954,808, Cl. 340-475.000.

Duerkob, Manfred F., to Duerkob, Dorothy I. Eye level rear mounted lighted turn and stop signal for vehicles. 4,954,808, Cl. 340-475.000.

Duffty, Bryan, to FMC Corporation. Water supporting and propulsion systems. 4,953,492, Cl. 114-282.000.

Dugrand, Louis: *See*—
Menigaux, Louis; and Dugrand, Louis, 4,955,030, Cl. 372-44.000.

Duh, Gabri C. B. Apparatus of heat preventer of a car. 4,953,448, Cl. 98-2.020.

Dukai, Jozsef: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.

Dullien, Francis A.; Chatzis, Ioannis; and Macdonald, Ian F., to University of Waterloo. Enhanced oil recovery process. 4,953,619, Cl. 166-265.000.

Dumoulin, Michel M.: *See*—
Marchildon, Ernest K. A.; Muzyka, Douglas W.; and Dumoulin, Michel M., 4,954,302, Cl. 264-40.100.

Dunlap, Richard L., to Plastipak Packaging, Inc. In-mold label dispenser having single actuator for dispensing head and label carrier. 4,954,070, Cl. 425-503.000.

Dunn, Richard P., to Charles Machine Works, Inc., The. Method of and apparatus for drilling a horizontal controlled borehole in the earth. 4,953,638, Cl. 175-61.000.

Dunne, Matthew C.: *See*—
Coombs, Donald W.; and Anderson, Andrew A., 4,953,865, Cl. 273-176.00F.

Dunshee, Wayne K., to Minnesota Mining and Manufacturing Company. Chemical thermal pack having an outer pouch provided with capillaries. 4,953,550, Cl. 128-403.000.

Dunstan, Jacqueline M.: *See*—
Parsons, Kevin L.; Grundy, Gary M.; and Dunstan, Jacqueline M., 4,953,769, Cl. 224-247.000.

Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, to Bayer Aktiengesellschaft. Lacquer binders, coating compositions and wire enamels based on polyamideimides and isocyanates carrying carbodiimide and/or uretone imine groups. 4,954,577, Cl. 525-420.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bartlett, Philip L.; Creazzo, Joseph A.; and Gorski, Robert A., 4,954,289, Cl. 252-305.000.
Bartlett, Philip L.; Creazzo, Joseph A.; and Gorski, Robert A., 4,954,290, Cl. 252-305.000.
Den Hartog, Herman C.; Kosaza, Eileen E.; Matthews, James F.; and Werner, Ervin R., Jr., 4,954,559, Cl. 524-507.000.
Dorai, Suriyanarayanan; and Ernst, Richard E., 4,954,658, Cl. 568-617.000.
Eveleigh, John William d.; and Kobos, Robert K., 4,954,444, Cl. 435-181.000.
Pepin, John G., 4,954,926, Cl. 361-304.000.
Putzig, Donald E.; and Smeltz, Kenneth C., 4,953,621, Cl. 166-308.000.
Rushmere, John D., 4,954,220, Cl. 162-168.300.
Simmons, Walter J., 4,954,052, Cl. 417-331.000.
Thomassen, Egidius T. R., 4,954,104, Cl. 439-751.000.
Ziegenhain, William C., 4,954,330, Cl. 423-484.000.

Dupree, Leonard J.: *See*—
Kierum, Chandler T.; and Dupree, Leonard J., 4,953,763, Cl. 222-644.000.

Durante, Joseph L., to Zurn Industries, Inc. Vibratory fuel feeder for furnaces. 4,954,034, Cl. 414-156.000.

Durda, Joseph A., to Aeration Industries, Inc. Propeller aerator with peripheral injection of fluid and method of using the aerator. 4,954,295, Cl. 261-16.000.

Durham, Samuel: *See*—
Edwards, William A.; and Durham, Samuel, 4,953,593, Cl. 137-606.000.

Durkin, Robert O. Removable chassis front pin and front bolster end assembly. 4,954,029, Cl. 410-80.000.

Duro Industries, Inc.: *See*—
Goldberg, Stanley, 4,954,392, Cl. 428-244.000.

Durr, Larry J.: *See*—
Durr, Larry L.; Clay, B. Jan; and Durr, Larry J., 4,954,222, Cl. 202-176.000.

Durr, Larry L.; Clay, B. Jan; and Durr, Larry J. Dry cleaning solvent filtration and recovery system with filter rinsing apparatus. 4,954,222, Cl. 202-176.000.

Dutton, Susan: *See*—
Elliott, Thomas J.; and Dutton, Susan, 4,954,532, Cl. 514-846.000.

Dutzmann, Stefan: *See*—
Stroech, Klaus; Beilefeldt, Dietmar; Brandes, Wilhelm; and Dutzmann, Stefan, 4,954,162, Cl. 71-92.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Richartz, Erich, 4,953,379, Cl. 72-187.000.

Dynamics Research Corporation: *See*—
Bakewell, Joseph J., 4,954,225, Cl. 204-11.000.

Dynamit Nobel Aktiengesellschaft: *See*—
von Gerlach, Johann, 4,953,466, Cl. 102-521.000.

Dynavector, Inc.: *See*—
Tominari, Noboru, 4,955,057, Cl. 381-63.000.

Dynobel A/S: *See*—
Flodman, Leif A.; and Gabrielsson, Per E. G., 4,954,581, Cl. 525-497.000.

Dytel Corporation: *See*—
Morganstein, Sanford J.; Bindl, Ron H.; Klecka, Mark D.; Krakau, Herbert B.; and Dawson, Thomas M., 4,955,047, Cl. 379-112.000.

Dziekan, John T., to Pristine Products. Process for applying identification to objects made of porous material. 4,954,192, Cl. 156-154.000.

E-Con-Mega Mix: *See*—
Tousignant, Robert C.; Tousignant, James W.; and Tousignant, Richard L., 4,953,752, Cl. 222-23.000.

East, Anthony J., to Hoechst Celanese Corp. Side chain liquid crystalline polymers exhibiting nonlinear optical response. 4,954,288, Cl. 252-299.010.

Eastman Christensen Company: *See*—
Kotlyar, Oleg, 4,953,595, Cl. 137-624.130.

Eastman Kodak Company: *See*—
Bagrodia, Shriram; and Phillips, Bobby M., 4,954,398, Cl. 428-400.000.
Chi, Chao S., 4,954,825, Cl. 341-64.000.
Fry, Slaton E.; Magouyrk, David W.; Blankenship, Allen J.; Greene, Paul J.; and Johnson, Larry K., 4,954,573, Cl. 525-327.600.
Puckette, Thomas A., 4,954,227, Cl. 204-72.000.

Eastmond, Bruce C.: *See*—
Phillips, Sharon E. T.; and Eastmond, Bruce C., 4,955,083, Cl. 455-47.000.

Eaton Corporation: *See*—
McGovern, Kevin M.; and Schoenhals, Robert C., 4,953,517, Cl. 123-559.100.

Ebara, Katsuya: *See*—
Hayashi, Nobuatsu; Takahashi, Sankichi; Ebara, Katsuya; Kurokawa, Hideaki; Yamada, Akira; Koseki, Yasuo; Matsuzaki, Harumi; and Yoda, Hiroaki, 4,953,694, Cl. 202-180.000.

Ebbing, Peter; and Birang, Manoocher, to Applied Materials, Inc. Method and apparatus for endpoint detection in a semiconductor wafer etching system. 4,953,982, Cl. 356-357.000.

Ebert, Wolfram; Handrich, Eberhard; Hafen, Martin; and Ryrko, Bruno, to Litef GmbH. Pendulum with bending spring joint. 4,953,834, Cl. 267-160.000.

Echelon Systems Corporation: *See*—
Twitty, William B.; and Sander, Wendell B., 4,955,018, Cl. 370-85.100.

Eckhardt, Volker: *See*—
Dicke, Hans-Rudolf; Genz, Joachim; Eckhardt, Volker; and Bottenbruch, Ludwig, 4,954,606, Cl. 528-170.000.
Genz, Joachim; Dicke, Hans-Rudolf; Eckhardt, Volker; and Kleiner, Frank, 4,954,604, Cl. 528-125.000.

Edgar, Duane: *See*—
Kumar, Shalabh; and Edgar, Duane, 4,954,763, Cl. 318-605.000.

Edgerton, Cathy J.: *See*—
Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., 4,954,089, Cl. 439-76.000.

Edington, Bruce L., to Halliburton Geophysical Services, Inc. Time delay source coding. 4,953,657, Cl. 181-111.000.

Edwards, Cyril K. Method and apparatus for hydroponic cultivation. 4,953,322, Cl. 47-64.000.

Edwards, John, to Waters, William P. Catheter/heparin lock and method of using same. 4,954,130, Cl. 604-169.000.

Edwards, William A.; and Durham, Samuel. Fluid mixing apparatus for producing variably carbonated water. 4,953,593, Cl. 137-606.000.

EEV Limited: *See*—
Maitland, Arthur; and Livingstone, Ewan S., 4,955,033, Cl. 372-56.000.
Weatherup, Clifford R., 4,954,748, Cl. 313-153.000.

EFG Foods, Inc.: *See*—
Figueras, Rosalino; and Micko, George, 4,953,455, Cl. 99-450.600.

Efner, Howard F., to Phillips Petroleum Company. Process for the preparation of secondary and tertiary amines. 4,954,654, Cl. 564-446.000.

Ehr, Robert J.: *See*—
Kleschik, William A.; Ehr, Robert J.; Costales, Mark J.; Gerwick, Ben C., III; Meikle, Richard W., deceased; Monte, William T.; and Pearson, Norman R., 4,954,163, Cl. 71-92.000.

Ehrmann, Ronald G.: *See*—
Schreck, Daniel J.; and Ehrmann, Ronald G., 4,953,289, Cl. 29-863.000.

Eibner, Jules A.; and Zundel, Jean-Pol, to Unisys Corporation. Personal computer with multiple independent CRT displays of ideographic and/or ASCII characters having loadable font memory for storing digital representations of subset or special characters. 4,954,979, Cl. 364-900.000.

Eichner, Fred N.: *See*—
Miller, Steven D.; McDonald, Joseph C.; Eichner, Fred N.; and Tomeraasen, Paul L., 4,954,707, Cl. 250-337.000.

Eidai Industry Co., Ltd.: *See*—
Kawaguchi, Shiro; and Kai, Katsunori, 4,953,335, Cl. 52-384.000.

Eidt, Clarence M., Jr.; Aldridge, Clyde L.; and Bearden, Roby, Jr., to Exxon Research & Engineering Company. Combination coking and hydroconversion process. 4,954,240, Cl. 208-50.000.

Eisai Co., Ltd.: *See*—
Miyamoto, Tsutomu; Igarashi, Hisanaga; and Hidenori, Sugiyama, 4,954,530, Cl. 514-718.000.
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.

Eisen, Yossef: *See*—
Zigler, Arie; Eisen, Yosset; and Eisen, Yossef, 4,954,709, Cl. 250-385.100.

Eisen, Yosset: *See*—
Zigler, Arie; Eisen, Yosset; and Eisen, Yossef, 4,954,709, Cl. 250-385.100.

Eisenbarth, Rudolf: *See*—
Crispin, Norbert; Schumacher, Hartmut; Vogt, Harald; and Eisenbarth, Rudolf, 4,953,277, Cl. 29-407.000.

Eisenstein, Gadi: *See*—
Alferness, Rodney C.; Eisenstein, Gadi; Koren, Uziel; Tien, Ping K.; Tucker, Rodney S.; and Whalen, Matthew S., 4,955,028, Cl. 372-20.000.

Eisermann, Armin, to Schulte Schlagbaum Aktiengesellschaft. Safe equipped with a permutation lock whose locking function is released by the insertion of a coin or coins. 4,953,683, Cl. 194-235.000.

Ejima, Satoshi; and Yamamoto, Tetsuya, to Nikon Corporation. Electronic still camera system with automatic gain control of image signal amplifier before image signal recording. 4,954,897, Cl. 358-228.000.

Ekins, Robin K. Analog-to-digital converter. 4,954,831, Cl. 341-159.000.

Elantsev, Jury S.: *See*—
Urvantsev, Anatoly I.; Elantsev, Jury S.; Komlev, Alexei M.; Kusembaev, Saliman K.; Stepanov, Jury I.; and Vasiliev, Viktor P., 4,954,248, Cl. 209-127.100.

Elberbaum, David, to Elbex Video, Ltd. Closed circuit television apparatus with a remote control television camera. 4,954,886, Cl. 358-86.000.

Elbex Video, Ltd.: *See*—
Elberbaum, David, 4,954,886, Cl. 358-86.000.

Eldon Industries, Inc.: *See*—
Sharber, Jerry; and Kilby, Frank, 4,953,822, Cl. 248-281.100.

Electro-Optics Technology, Inc.: *See*—
Scerbak, David G., 4,955,034, Cl. 372-94.000.

Electronics for Industry, Ltd.: *See*—
Pratolongo, odesto, 4,954,359, Cl. 426-557.000.

Electronics and Telecommunications Research Institute: *See*—
Kim, Kwang S.; Chai, Sang Hun; Koo, Young S.; Kim, Yeo H.; and Lee, Jin H., 4,954,456, Cl. 437-31.000.

Eli Lilly and Company: *See*—
Nagarajan, Ramakrishnan, 4,954,623, Cl. 536-127.000.

Elings, Virgil B.; and Maivald, Peter, to Digital Instruments, Inc. Method to increase the speed of a scanning probe microscope. 4,954,704, Cl. 250-307.000.

Ellion, Dolores D.; and Ellion, M. Edmund. Powder dispensing and measuring device. 4,953,643, Cl. 177-123.000.

Ellion, M. Edmund: *See*—
Ellion, Dolores D.; and Ellion, M. Edmund, 4,953,643, Cl. 177-123.000.

Elliott, David L.; Christiano, Steven P.; Lang, David J.; and Sisco, Rosemary M., to Lever Brothers Company. Machine dishwashing composition. 4,954,280, Cl. 252-90.000.

Elliott, Thomas J.; and Dutton, Susan, to Beecham Group p.l.c. Cosmetic formulaton. 4,954,532, Cl. 514-846.000.

Elmaleh, Samuel; and Grasmick, Alain, to Mornex Limited. Process for the treatment and purification of water by the flocculation of suspended particles in a fluidized bed. 4,954,259, Cl. 210-617.000.

Elrod, Jimmie L.; and Lee, Robert G., to Tennessee Valley Authority. Sonic gelling of clay in suspension fertilizers. 4,954,155, Cl. 71-28.000.

Elscint Ltd.: *See*—
Zur, Yuval, 4,954,779, Cl. 324-306.000.

Emert, Jacob; and Lundberg, Robert D., to Exxon Chemical Patents Inc. Dispersant additives prepared from monoepoxy alcohols. 4,954,572, Cl. 525-285.000.

Emhart Industries, Inc.: *See*—
Richmond, James W., 4,953,493, Cl. 116-28.100.
Richmond, James W., 4,954,775, Cl. 324-174.000.
Wooge, Christian; and Speisebecher, Joachim, 4,953,739, Cl. 220-93.000.

Emily, Jean Y., to Atochem. Mulching and seeding apparatus and method with film severing and covering. 4,953,482, Cl. 111-144.000.

Emori, Kiyoshi: *See*—
Yamaguchi, Ikunori; Emori, Kiyoshi; and Morikawa, Takashi, 4,954,968, Cl. 364-519.000.

Emory University: *See*—
Savage-Rumbaugh, E. Sue; Rumbaugh, Duane M.; Smith, Samuel O.; and Smith, Michael B., 4,953,500, Cl. 119-17.000.

Encore Video, Inc.: *See*—
Kaye, Michael C., 4,954,881, Cl. 358-22.000.

Endo, Keiichi; Shinbo, Yasushi; Kageyama, Akira; Katsuya, Yasuo; Kato, Chihiro; Fukasawa, Masato; and Sekine, Makoto, to Hitachi Chemical Company, Ltd. Electrophotographic plate including an undercoating layer having a smooth surface. 4,954,406, Cl. 430-60.000.

Endo, Kunio; and Katsukawa, Tadashi, to NEC Home Electronics Ltd. Color masking circuit and color video printer using the same. 4,954,889, Cl. 358-80.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; and Adler, David, 4,954,182, Cl. 136-249.000.

Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., to AT&T Bell Laboratories. Interconnect fabric providing connectivity between an input and arbitrary output(s) of a group of outlets. 4,955,016, Cl. 370-60.000.

Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., to AT&T Bell Laboratories. Growable packet switch architecture. 4,955,017, Cl. 370-60.000.

Engel, Michael; Pepping, Karl-Heinz; and Gebhardt, Gunther, to Diehl GmbH & Co. Power-transmission joint. 4,953,421, Cl. 74-523.000.

Engelson, Gary S.: *See*—
Leis, Michael; Engelson, Gary S.; and Lawrence, Bruce J., 4,954,788, Cl. 331-16.000.

Engineering & Research Associates, Inc.: *See*—
Harmony, Daniel C.; Gummere, John B.; and Minney, Stephen C., 4,954,678, Cl. 219-10.430.

England, Thomas R.: *See*—
Schultz, Roy D.; England, Thomas R.; and Altizer, A. Clark, 4,954,739, Cl. 310-156.000.

Engler, Heidrun: *See*—
Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 4,954,501, Cl. 514-252.000.

Engler, Richard A.: *See*—
Anthony, Thomas R.; DeVries, Robert C.; Engler, Richard A.; Ettinger, Robert H.; and Fleischer, James F., 4,953,499, Cl. 118-724.000.

Enichem Anic S.p.A.: *See*—
Messina, Giuseppe; Nurra, Carmelo; Cappellazzo, Oscar; Virdis, Angelo; and Lorenzoni, Loreno, 4,954,660, Cl. 568-697.000.

Enichem Sintesi S.p.A.: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,954,653, Cl. 564-223.000.

Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, to Sumitomo Chemical Company, Limited. Tetrahydroindazolyl-benzoxazines, their production and use. 4,954,626, Cl. 544-105.000.

Enomoto, Ryo: *See*—
Miyazaki, Yasumitsu; Enomoto, Ryo; and Yamada, Masaya, 4,953,931, Cl. 350-96.120.
Miyazaki, Yasumitsu; Enomoto, Ryo; and Yamada, Masaya, 4,953,943, Cl. 350-96.120.

Enomoto, Tsugio: *See*—
Okuyama, Nobuhisa; Goto, Shiuichi; and Enomoto, Tsugio, 4,954,047, Cl. 417-203.000.

Enviro-Gro Technologies: *See*—
Glorioso, John D., 4,953,478, Cl. 110-215.000.

Environmental Recovery Systems, Inc.: *See*—
Greenberg, Bernard; and Sulner, Andrew, 4,954,265, Cl. 210-710.000.

Environmental Research Institute of Michigan: *See*—
Zuk, David M., 4,953,972, Cl. 356-4.000.

Epworth, Richard E., to STC PLC. Optical fibre transmission systems. 4,953,939, Cl. 350-96.190.

Equipment Development Company, Inc.: *See*—
Swan, Leo, 4,953,523, Cl. 125-14.000.

Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, to MAN Technologie GmbH. Thermally insulated stirling engine-hot gas heater system combination. 4,953,354, Cl. 60-517.000.

Erbes, John G.: *See*—
Dixon, Robert C.; Deaver, Gerald A.; Punches, James R.; Singleton, Guy E.; Erbes, John G.; and Offer, Henry P., 4,954,311, Cl. 376-258.000.

Erickson, Laurence R.; Behr, R. Douglas; and Vrooman, Roger D., to Dow Chemical Company, The. Stand-up plastic bag and method of making same. 4,954,124, Cl. 493-195.000.

Erickson, Robert W., Jr.: *See*—
Jao, Tze C.; Morton, Nancy A.; and Erickson, Robert W., Jr., 4,954,272, Cl. 252-25.000.

Ericsson, Sylve J. D., to Svecia Silkscreen Maskiner AB. Method for positioning material in a plurality of printing positions for multi-color silkscreen printing. 4,953,459, Cl. 101-115.000.

Erkki, Kiiskila; and Rolf, Ryham, to A. Ahlstrom. Multistage evaporating system. 4,953,607, Cl. 159-13.300.

Erman, Marko: *See*—
Le Bris, Jean; Erman, Marko; and Gillardin, Gerard, 4,954,713, Cl. 250-458.100.

Ermont C. M.: *See*—
Marconnet, Guy, 4,954,995, Cl. 366-7.000.

Ernst, Richard E.: *See*—
Dorai, Suriyanarayanan; and Ernst, Richard E., 4,954,658, Cl. 568-617.000.

Ernst Siegling, Firma: *See*—
Herzke, Harry, 4,953,690, Cl. 198-690.200.

Ersek, Tibor: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,954,495, Cl. 514-231.200.

ESAB Welding Products, Inc.: *See*—
Winterfeldt, Duane N., 4,954,688, Cl. 219-121.500.

Esaki, Seiji: *See*—
Sasaki, Akira; Esaki, Seiji; Hashimoto, Yasushi; and Kurita, Shigeo, 4,954,119, Cl. 464-111.000.

Escorcio, Tolentino: *See*—
Lo, Ying-Ching; Zambre, Samuel; and Escorcio, Tolentino, 4,954,960, Cl. 364-484.000.

Eskelinen, Pekka; Rastikainen, Pentti; Karlsson, Markku; and Virta, Raimo, to Valmet Paper Machinery Inc. Method of and device for pocket ventilation in the drying section of a paper machine, in particular for high-speed paper machines. 4,953,297, Cl. 34-23.000.

Esposito, Antonio: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,954,653, Cl. 564-223.000.

Essiz, Munir: *See*—
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,954,507, Cl. 514-300.000.

Esswein, Karlheinz; and Kummer, Ludwig, to Carl-Zeiss-Stiftung. Microscope objective for accommodating different cover-glass thicknesses. 4,953,962, Cl. 350-507.000.

Ethyl Corporation: *See*—
Schleifstein, Robert A.; and Khuddus, Mohammed A., 4,954,551, Cl. 524-327.000.

Ettinger, Robert H.: *See*—
Anthony, Thomas R.; DeVries, Robert C.; Engler, Richard A.; Ettinger, Robert H.; and Fleischer, James F., 4,953,499, Cl. 118-724.000.

Etzweiler, Franz, to Givaudan Corporation. Device for branching gas flows. 4,954,150, Cl. 55-386.000.

Euroceltique S.A.: *See*—
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.

Evamy, David L., to Psychopax Limited. Package having detent-engaged cushioning lining. 4,953,705, Cl. 206-594.000.

Evans, Alan G.; and Stein, William L., to United States of America, Navy. Method for determining astronomic azimuth. 4,954,833, Cl. 342-357.000.

Evans, John M. Method and apparatus for the measurement of thoracic field potentiometry. 4,953,556, Cl. 128-671.000.

Evans, John M., Jr.; Weiman, Carl F. R.; and King, Steven J., to Transitions Research Corporation. Visual navigation and obstacle avoidance structured light system. 4,954,962, Cl. 364-513.000.

Evans & Sutherland Computer Corp.: *See*—
Watkins, Gary S., 4,954,819, Cl. 340-721.000.

Evans, William E., to Roussel Bio Corporation. Dry powder applicator. 4,953,792, Cl. 239-654.000.

Eveleigh, John William d.; and Kobos, Robert K., to Du Pont de Nemours, E. I., and Company. Enzyme immobilization and bioaffinity separations with perfluorocarbon polymer-based supports. 4,954,444, Cl. 435-181.000.

Evenzon, Vladimir: *See*—
Kuchta, Richard; Billings, Larry; Evenzon, Vladimir; and Bristow, Donald, 4,953,469, Cl. 104-127.000.

Ewbank, Mark D.; Chang, Tallis Y.; and Feinberg, Jack L., to Rockwell International Corporation. Phase-conjugate communication using mutually incoherent laser beams. 4,953,954, Cl. 350-354.000.

Exxon Chemical Patents Inc.: *See*—
Best, Steven A., 4,954,471, Cl. 502-110.000.
Emert, Jacob; and Lundberg, Robert D., 4,954,572, Cl. 525-285.000.
Gutierrez, Antonio; and Lundberg, Robert D., 4,954,276, Cl. 252-49.600.
Gutierrez, Antonio; and Lundberg, Robert D., 4,954,277, Cl. 252-49.600.
Luker, Norman E., 4,954,352, Cl. 425-296.000.

Exxon Research & Engineering Company: *See*—
Eidt, Clarence M., Jr.; Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,954,240, Cl. 208-50.000.
Halbert, Thomas R.; Wei, Liwen; and Stiefel, Edward I., 4,954,645, Cl. 556-45.000.
Lipkin, Gregory M.; and Niedzwiecki, Joseph L., 4,954,247, Cl. 208-355.000.

Faber, Andrea J.: *See*—
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,954,004, Cl. 403-13.000.

Faber, Inken A. H.: *See*—
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,954,004, Cl. 403-13.000.

Faber, Knut: *See*—
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,954,004, Cl. 403-13.000.

Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., to AB Sandvik Coromant. Coupling device between two elements. 4,954,004, Cl. 403-13.000.

Faber, Ute M. I.: *See*—
Faber, Kurt H. A. E.; Faber, Ute M. I.; Faber, Knut; Faber, Inken A. H.; and Faber, Andrea J., 4,954,004, Cl. 403-13.000.

Fabre, Frederic: *See*—
Cailly, Francinet; and Fabre, Frederic, 4,954,293, Cl. 252-625.000.

Fabschitz, Heinz: *See*—
Memminger, Gustav; Fabschitz, Heinz; and Kuhn, Falk, 4,953,367, Cl. 66-132.00R.

Fahnestock, Stephen R., to Genex Corporation. Cloned streptococcal genes encoding protein G and their use to construct recombinant microorganisms to produce protein G. 4,954,618, Cl. 530-387.000.

Faith, William C.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Faith, William C., 4,954,494, Cl. 514-210.000.

Falbe, Juergen: *See*—
Carduck, Franz-Josef; Falbe, Juergen; Fleckenstein, Theo; Goebel, Gerd; and Pohl, Joachim, 4,954,664, Cl. 568-864.000.

Falcon, John A.: *See*—
Corti, Aldo; and Falcon, John A., 4,954,254, Cl. 210-209.000.

Fandrich, Darrell G.; and Trevelas, Chris A. Action for grand piano. 4,953,433, Cl. 84-239.000.

Fanger, Michael W.; Guyre, Paul M.; and Anderson, Clark L., to Dartmouth College, Trustees of. Monoclonal antibodies to FC receptors for immunoglobulin G on human mononuclear phagocytes. 4,954,617, Cl. 530-387.000.

Fanuc Ltd.: *See*—
Torii, Nobutoshi; and Otsuka, Kazuhisa, 4,953,992, Cl. 384-607.000.
Yamauchi, Takashi, 4,954,980, Cl. 364-900.000.

Farber, Bruce: *See*—
Barradas, Scott; Farber, Bruce; and Luther, William B., 4,953,295, Cl. 30-380.000.

Fargnier, Jean A. Automatic door closer having an adjustable torsion spring and configured end fittings. 4,953,260, Cl. 16-308.000.

Farmitalia Carlo Erba S.r.l.: *See*—
Alpegiani, Marco; Perrone, Ettore; Orezzi, Piergiuseppe; Carminati, Paolo; and Cassinelli, Giuseppe, 4,954,493, Cl. 514-195.000.

Farrar, Grover L.: *See*—
Swofford, Howard W.; Rice, Sandra W.; Farrar, Grover L.; and Rudd, David, 4,954,396, Cl. 428-340.000.

Faulstich, Ingo, to Hermann Pfauter GmbH & Co. Process for the discontinuous profile grinding or profile milling of gear wheels. 4,954,027, Cl. 409-26.000.

Fazzolari, Luciano; Giattini, Frank P.; Scoca, Anthony L.; and Zavacki, Eugene C., to Unisys Corporation. Navigation sonar system dockside simulator. 4,954,996, Cl. 367-13.000.

Fecher, Douglas A.; and Dodd, Thomas E., to Allied-Signal Inc. Key member for retaining a control valve in a hub. 4,953,446, Cl. 91-369.300.

Fedorov, Svyatoslav N. Device for correcting ocular refraction anomalies. 4,953,969, Cl. 351-221.000.

Fee, Graham M., to Chemetron-Railway Products, Inc. Two piece rail fastening assemblies for wooden cross ties. 4,953,787, Cl. 238-349.000.

Fehr, Friedhard: *See*—
Berthold, Gottfried; Limpert, Rudolf; and Fehr, Friedhard, 4,954,804, Cl. 338-162.000.

Fehr, William A.; and Buck, Brian G. Diesel engine secondary fuel injection system. 4,953,515, Cl. 123-526.000.

Fehrer, Ernst. Apparatus for making a yarn. 4,953,349, Cl. 57-315.000.

Feinberg, Jack L.: *See*—
Ewbank, Mark D.; Chang, Tallis Y.; and Feinberg, Jack L., 4,953,954, Cl. 350-354.000.

Felsheim, James A.: *See*—
Carter, John L.; Sprague, Michael M.; Stone, Crosby; and Felsheim, James A., 4,953,298, Cl. 34-44.000.

Fentiman, Al: *See*—
Davis, Paul D.; Schuster, Gary B.; Truini, Jacqueline G.; and Fentiman, Al, 4,954,415, Cl. 430-138.000.

Ferag AG: *See*—
Honegger, Werner, 4,953,847, Cl. 271-277.000.
Reist, Walter, 4,953,843, Cl. 271-3.100.

Fergason, James L., to Manchester R & D Partnership. Complementary color liquid display. 4,953,953, Cl. 350-339.00F.

Fertel, Lawrence B.; and O'Reilly, Neil J., to Occidental Chemical Corporation. Single pot process for making a fluoroanthranilic acid. 4,954,639, Cl. 548-475.000.

Fertl, Walter H.; and Sinha, Ashok K., to Western Atlas International, Inc. Method and apparatus for determining characteristics of clay-bearing formations. 4,953,399, Cl. 73-152.000.

Fes-co System USA, Inc.: *See*—
Beer, Jeffrey S.; Gracie, Michael D., Sr.; and Vigano, Tullio U., 4,953,708, Cl. 206-632.000.

Fey, Maurice G.; Iyer, Natraj C.; Male, Alan T.; and Lovic, William R., to Westinghouse Electric Corp. Methods of making high performance compacts and products. 4,954,170, Cl. 75-229.000.

Fey, Rainer, to Fichtel & Sachs AG. Control circuit for an electromagnetic breaking arrangement. 4,954,759, Cl. 318-375.000.

Fiano, Elizabeth A.: *See*—
Coleman, Charles R.; Wolfe, Terry L.; Winter, John A.; and Fiano, Elizabeth A., 4,954,153, Cl. 65-60.530.

Fiat Auto S.p.A.: *See*—
Lupo, Giorgio; and Capra, Pier C., 4,953,881, Cl. 280-91.000.

Fiberglas Canada Inc.: *See*—
Wallace, Keith, 4,953,344, Cl. 53-528.000.

Fichtel & Sachs AG: *See*—
Fey, Rainer, 4,954,759, Cl. 318-375.000.

Fiden, William H., to Hughes Aircraft Company. Data link using electronically steerable beam. 4,954,829, Cl. 342-60.000.

Fierfort, Claude: *See*—
Masson, Jean-Pierre; Bourseul, Jacky; and Fierfort, Claude, 4,953,398, Cl. 73-151.000.

Figueras, Rosalino; and Micko, George, to EFG Foods, Inc. Food wrapper apparatus. 4,953,455, Cl. 99-450.600.

Finan, Donald S.: *See*—
Lang, Gary D.; Finan, Donald S.; and Rhoades, George D., 4,953,365, Cl. 62-381.000.

Findakly, Talal K.: *See*—
Suchoski, Paul G., Jr.; Findakly, Talal K.; and Leonberger, Frederick J., 4,953,935, Cl. 350-96.160.

Fine, Joseph; and Marton, Denes, to United States of America, Commerce. Scanning scattering microscope with hemispherical mirror and microfocused beam. 4,954,722, Cl. 250-571.000.

Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, to International Business Machines Corporation. Low-voltage source for narrow electron/ion beams. 4,954,711, Cl. 250-423.00R.

Finn, Maryann P.: *See*—
Sherlock, Lila A.; and Finn, Maryann P., 4,953,851, Cl. 272-70.300.

Fioravanti, Kenneth J.; Zelson, Larry S.; and Baukal, Charles E., Jr., to Air Products and Chemicals, Inc. Flame stabilized oxy-fuel recirculating burner. 4,954,076, Cl. 431-116.000.

Fischer, Douglas A.; and Meinke, Joseph S., to Lescoa, Inc. Drawer mounted cup holder. 4,953,771, Cl. 224-273.000.

Fischer, Elmar R., to Intermedics, Inc. Replacement connector for implanted leads. 4,954,105, Cl. 439-864.000.

Fischer, Eugene C.; and Crane, Roger M., to United States of America, Navy. Load bearing connective damper. 4,954,377, Cl. 428-36.100.

Fischer, Gerald W.: *See*—
Hunter, Kenneth W.; and Fischer, Gerald W., 4,954,449, Cl. 435-240.270.

Fischer & Porter Company: *See*—
Appel, Eggert; Kiese, Wilfried; Kuchemann, Rudi; Meier, Dieter; and Nissen, Peter, 4,953,408, Cl. 73-861.160.
Marchewka, Werner; Rackebrandt, Karl-Heinz; Schafer, Klaus; and Seebode, Albert, 4,953,409, Cl. 73-861.170.

Fisher, Lynn E., to General Electric Company. Method of assembling a dynamoelectric machine. 4,953,285, Cl. 29-596.000.

Fishman, Oleg; Prabhu, Satyen N.; Burk, John P.; and Tabatabaei, Emad, to Inductotherm Corp. Stopper rod spatial control mechanism. 4,953,761, Cl. 222-602.000.

Fitzsimmons, Alan H.: *See*—
Hammer, Joe K.; Fitzsimmons, Alan H.; and Greutmann, Hans, 4,953,284, Cl. 29-596.000.

Flanhardt, Michael: *See*—
Coenen, Karl; Flanhardt, Michael; and Langen, Hans-Jurgen, 4,953,411, Cl. 73-862.330.

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Carduck, Franz-Josef; Falbe, Juergen; Fleckenstein, Theo; Goebel, Gerd; and Pohl, Joachim, 4,954,664, Cl. 568-864.000.

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Fleischer, James F.: *See*—
Anthony, Thomas R.; DeVries, Robert C.; Engler, Richard A.; Ettinger, Robert H.; and Fleischer, James F., 4,953,499, Cl. 118-724.000.

Fleming, Diane: *See*—
Sewell, Scott R.; and Fleming, Diane, 4,953,328, Cl. 52-79.100.

Flexon Holland, B.V.: *See*—
Janzen, Wolfgang, 4,953,691, Cl. 198-803.010.

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Floraline Display Products Corp.: *See*—
Primozic, Randolph J., 4,953,363, Cl. 62-255.000.

Flotow, Richard A.; and Sullivan, Patrick M., to Dana Corporation. Clutch adjuster. 4,953,680, Cl. 192-111.00B.

Flueli, Adolf: *See*—
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, 4,953,802, Cl. 242-46.200.

Fluid Management Limited Partnership: *See*—
Miller, William A., 4,953,985, Cl. 366-244.000.

FMC Corporation: *See*—
Becicka, Kenneth F.; and Chamberlain, Neal C., 4,954,042, Cl. 414-718.000.
Duffty, Bryan, 4,953,492, Cl. 114-282.000.
Theodoridis, George, 4,954,159, Cl. 71-86.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz, 4,953,711, Cl. 209-535.000.

Focke, Heinz, to Focke & Co. (GmbH & Co.). Method and device for eliminating imperfect cigarettes in connection with a cigarette packaging machine. 4,953,711, Cl. 209-535.000.

Fogaroli, Giuseppe; Coli, Giuseppe; Tadini, Giorgio; and Meazza, Giampiero, to Ing. C. Olivetti & C., S.p.A. Apparatus for reading and digital processing of color images. 4,954,888, Cl. 358-75.000.

Foglio, Salvatore, to Nuova Sanac S.p.A.; and ILVA S.p.A. Slide-gate pouring appliance for ladles and similar devices. 4,953,760, Cl. 222-600.000.

Foit, Vilem, to Harnischfeger Corporation. Anti-sway crane reeving apparatus. 4,953,721, Cl. 212-147.000.
Fontaine, James A.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,955,024, Cl. 371-40.100.
Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, to Alcatel Espace. Method of digitally evaluating the frequency and the phase of signals, and a device for implementing such a method. 4,954,961, Cl. 364-484.000.
Food Service Innovations, Inc.: *See*—
Weihe, Clyde; Maroti, Lewis; and Albertini, Peter, 4,954,250, Cl. 209-629.000.
Ford, Michael G., to Baxter International Inc. Therapeutics plasma exchange system. 4,954,128, Cl. 604-5.000.
Ford Microelectronics, Inc.: *See*—
Lemnios, Zachary, 4,954,852, Cl. 357-15.000.
Forehand, Richard L.: *See*—
Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., 4,953,622, Cl. 166-327.000.
Forth, Hans-Joachim; and Hafner, Hans-Ulrich, to Leybold Aktiengesellschaft. Method of adapting a two-stage refrigerator cryopump to a specific gas. 4,953,359, Cl. 62-55.500.
Fosco International Limited: *See*—
Villani, Jean P., 4,953,762, Cl. 222-606.000.
Fourdraine, John D.: *See*—
Welsh, Russell J.; and Fourdraine, John D., 4,955,070, Cl. 455-2.000.
Fowlkes, Robert L.: *See*—
Burgoyne, William F., Jr.; Langsam, Michael; and Fowlkes, Robert L., 4,954,144, Cl. 55-16.000.
Fox, Charles E., III. Exercise garment. 4,953,856, Cl. 272-119.000.
Fox, Leslie R.; Wade, Paul C.; and Schmidt, William L., to Digital Equipment Corp. Method of packaging and powering integrated circuit chips and the chip assembly formed thereby. 4,954,878, Cl. 357-81.000.
Fraatz, Robert J.: *See*—
DeVolk, Burton; Allen, Fritz; Newman, Cathy D.; and Fraatz, Robert J., 4,953,980, Cl. 356-338.000.
Frame, Wayne W., to Ball Corporation. Imaging and wide sector searching apparatus. 4,954,900, Cl. 358-213.260.
Framo Developments (UK) Limited: *See*—
Mohn, Frank, 4,953,636, Cl. 166-65.100.
Francino, Neal A. Lantern head for backpacker's stove. 4,954,075, Cl. 431-107.000.
Frank, John J., to Switchcraft, Inc. Electrical jack with fixed detent. 4,954,096, Cl. 439-346.000.
Franke, Horst; and Schmid, Hans-Jorg, to Alligator Ventilfabrik GmbH. Device and process for controlling air pressure in tires. 4,953,394, Cl. 73-146.500.
Frankenreiter, Michael; Rometsch, Rainer; and Seher, Jens-Peter, to Hewlett-Packard Company. Blood pressure monitor. 4,953,557, Cl. 128-677.000.
Franninge, Thomas K. Method and apparatus for cleaning a pipe system provided for the operation of baths. 4,954,179, Cl. 134-22.120.
Fransson, Rolf G.; Jansson, Bertil E., deceased; and Jannson, Magnus, Administrator, to Victor Hasselblad Aktiebolag. Electrical contact unit. 4,954,092, Cl. 439-152.000.
Frantl, Erich. Single-layer, polygonally-curved supportiug frame structure. 4,953,329, Cl. 52-81.000.
Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,953,453, Cl. 99-373.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,953,467, Cl. 104-7.100.
Frappier, Edward P.: *See*—
Hull, Ezekiel H.; and Frappier, Edward P., 4,954,649, Cl. 560-180.000.
Fraser, Michael J., to Refurbished Turbine Components Limited. Turbine blade repair. 4,953,776, Cl. 228-119.000.
Fredericks, Elmer R.: *See*—
Thompson, Stanley C.; and Fredericks, Elmer R., 4,953,868, Cl. 273-186.00A.
Freed, William T.: *See*—
Halliden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 4,954,574, Cl. 525-327.600.
Freeman, Leon D.: *See*—
Sawyer, Philip N.; and Freeman, Leon D., 4,954,521, Cl. 514-474.000.
Freeman, William A.; Pogorzelski, James S.; Solie, Darryl W.; and Wilson, Jacqueline H., to International Business Machines Corporation. Terminal communications circuit. 4,954,950, Cl. 364-200.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Brussel, Richard, 4,954,067, Cl. 425-406.000.
Brussel, Richard, 4,954,068, Cl. 425-406.000.
Friede, Dirk; Cirkel, Hans-Juergen; Baumgartl, Rudolf; and Schmutzler, Matthias, to Siemens Aktiengesellschaft. Plasma X-ray tube, in particular for X-ray preionization of gas lasers and method for produicng X-radiation with such an X-ray tube. 4,955,045, Cl. 378-122.000.
Friedman, Mark I.; Tordoff, Michael G.; DiNovi, Michael J.; and Rafka, Robert J., to Monell Chemical Senses Center. Use of 2,5-anhydro-d-mannitol as a food intake modifier. 4,954,531, Cl. 514-738.000.
Friedwald, Franklin. Apparatus for molding chocolate bars. 4,954,069, Cl. 425-453.000.
Fritch, John R.; Fruchey, Olan S; and Horlenko, Theodore, to Hoechst Celanese Corporation. Production of acetaminophen. 4,954,652, Cl. 564-223.000.
Fritz, William J., to McDonnell Douglas Corporation. Optical measurement of thin films. 4,953,974, Cl. 356-128.000.
Froehner, Stanley C.; and Morton, Mary E., to Dartmouth College, Trustees of. Dihydropyridine-sensitive calcium channel as a tumor associated marker. 4,954,436, Cl. 435-7.000.
Fromuth, Harry C.: *See*—
Halliden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 4,954,574, Cl. 525-327.600.
Fruchey, Olan S: *See*—
Fritch, John R.; Fruchey, Olan S; and Horlenko, Theodore, 4,954,652, Cl. 564-223.000.
Fry, Slaton E.; Magouyrk, David W.; Blankenship, Allen J.; Greene, Paul J.; and Johnson, Larry K., to Eastman Kodak Company. Modified chlorinated polyolefins. 4,954,573, Cl. 525-327.600.
Frye, Dale J.; Lindberg, Kenneth M.; Kindig, Alan L.; Stander, Robert J.; Buonodono, Joseph B.; Gras, Jeffrey D.; and Ozios, David A., to Prince Corporation. Armrest torque control. 4,953,259, Cl. 16-225.000.
Fu, Chia-Min; and Maholland, Michael K., to Phillips Petroleum Company. Treatment of spent cracking catalysts. 4,954,244, Cl. 208-120.000.
Fuji Electric Co., Ltd.: *See*—
Kasahara, Mitsuharu; Kogawa, Kuniyuki; and Hirota, Takato, 4,954,798, Cl. 335-161.000.
Nishiura, Masaharu; Ichimura, Takeshige; and Kamiyama, Michinari, 4,954,181, Cl. 136-244.000.
Sugata, Yoshinobu; Furusho, Noboru; and Tanaka, Tomomi, 4,954,405, Cl. 430-58.000.
Yamaguchi, Hitoshi, 4,953,470, Cl. 104-282.000.
Fuji Electric Corporate Research and Development Ltd.: *See*—
Nishiura, Masaharu; Ichimura, Takeshige; and Kamiyama, Michinari, 4,954,181, Cl. 136-244.000.
Fuji, Hiroshi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; Terashima, Shigeo; and Fujiwara, Tsuneo, to Sharp Kabushiki Kaisha. Digital signal reproduction apparatus for reading magneto-optical disks. 4,954,903, Cl. 360-46.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Abe, Kunihiro, 4,953,531, Cl. 123-414.000.
Munemura, Masahiro; and Takahashi, Kenji, 4,953,912, Cl. 296-191.000.
Fuji Photo Film Co., Ltd.: *See*—
Akisawa, Taiji, 4,953,252, Cl. 15-308.000.
Inoue, Noriyuki; Kojima, Tetsuro; Heki, Tatsuo; and Hirano, Shigeo, 4,954,427, Cl. 430-409.000.
Ishigaki, Kunio; and Naoi, Takashi, 4,954,430, Cl. 430-534.000.
Ishikawa, Takatoshi, 4,954,426, Cl. 430-386.000.
Iwano, Haruhiko, 4,954,425, Cl. 430-373.000.
Kato, Eiichi; and Ishii, Kazuo, 4,954,407, Cl. 430-96.000.
Koizumi, Takashi; and Ishizaka, Hideo, 4,954,319, Cl. 422-67.000.
Mochida, Mitsuyoshi; Maekawa, Tokuo; Takei, Hisashi; Matsumoto, Yasuo; Ohmura, Hiroshi; Sugimoto, Shigeru; Ushiro, Seimei; Asano, Seiji; and Yoshida, Toshio, 4,954,857, Cl. 354-75.000.
Nakamura, Takashi; and Uchiyama, Kaoru, 4,954,838, Cl. 354-320.000.
Nakamura, Taku; Hirano, Tsumoru; Funatsu, Eiji; and Ishikawa, Shunichi, 4,954,417, Cl. 430-138.000.
Nakayama, Yoshiaki; Saito, Kenji; and Kawada, Yukihiro, 4,954,884, Cl. 358-29.000.
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.
Shimura, Kazuo, 4,955,067, Cl. 382-62.000.
Shinagawa, Yukio; Oikawa, Toru; Yamanouchi, Junichi; and Shiratsuchi, Kentaro, 4,954,419, Cl. 430-215.000.
Takahashi, Ippei; and Wakita, Takeshi, 4,954,723, Cl. 250-572.000.
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Fuji Photo Optical Co., Ltd.: *See*—
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Fuji Xerox Co., Ltd.: *See*—
Aoki, Takayoshi; and Takeda, Masayuki, 4,954,409, Cl. 430-108.000.
Fujii, Eiji: *See*—
Aoki, Masaki; Torii, Hideo; Kuribayashi, Kiyoshi; Monji, Hideto; Umetani, Makoto; and Fujii, Eiji, 4,953,385, Cl. 72-462.000.
Fujii, Kozaburo: *See*—
Muta, Yoshifumi; and Fujii, Kozaburo, 4,954,056, Cl. 418-55.300.
Fujii, Takahiro: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,954,235, Cl. 204-273.000.
Fujikura Ltd.: *See*—
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 4,953,632, Cl. 165-104.260.
Fujimori, Tohru: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.

Fujioka, Junzo: *See*—
Nishiyama, Yukio; Fujioka, Junzo; Hino, Haruki; Matsuzaki, Yuji; Sakiyama, Masayuki; and Yokoyama, Minoru, 4,954,314, Cl. 419-45.000.

Fujisaki, Hisashi; and Shimada, Keiko, to NEC Corporation. Loud-speaking telephone with a frequency shifting circuit. 4,955,055, Cl. 379-390.000.

Fujisaki, Michio: *See*—
Kohno, Naoichi; Arai, Masahiro; Aneha, Akira; and Fujisaki, Michio, 4,954,820, Cl. 340-825.690.

Fujisawa Pharmaceutical Company, Ltd.: *See*—
Oku, Teruo; Kasahara, Ciyoshi; Ohkawa, Takehiko; and Hashimoto, Masashi, 4,954,496, Cl. 514-231.500.

Fujita, Tadasu: *See*—
Yamada, Osamu; and Fujita, Tadasu, 4,954,443, Cl. 435-178.000.

Fujita, Yatsuka: *See*—
Ueno, Ryuzo; Fujita, Yatsuka; Yamamoto, Munemitsu; and Kozakai, Hiroshi, 4,954,358, Cl. 426-331.000.

Fujitsu Limited: *See*—
Fukushima, Nobuhiro; and Sawaki, Ippei, 4,955,006, Cl. 369-13.000.
Imanaka, Yoshihiko; Machi, Takato; Yamanaka, Kazunori; Yokoyama, Hiromitsu; Kamehara, Nobuo; and Niwa, Koichi, 4,954,480, Cl. 505-1.000.
Sakamoto, Kiichi; Yasuda, Hiroshi; Yamada, Akio; and Kudou, Jinko, 4,954,717, Cl. 250-492.300.
Sasaki, Kazuya, 4,953,942, Cl. 350-96.230.
Tateishi, Terutaka; Koshino, Minoru; and Shimizu, Kazuyuki, 4,954,982, Cl. 364-900.000.

Fujiwara, Tsuneo: *See*—
Fuji, Hiroshi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; Terashima, Shigeo; and Fujiwara, Tsuneo, 4,954,903, Cl. 360-46.000.

Fujizaki, Tsutomu; and Shibata, Minoru, to Matsushita Electric Works, Ltd. Socket for mounting an IC chip package on a printed circuit board. 4,954,088, Cl. 439-73.000.

Fukao, Hiroaki; Ohkita, Teruhiko; Nagasaka, Nobusuke; and Ueno, Tateo, to Brother Kogyo Kabushiki Kaisha. Overedge sewing machine for cutting the edge of a fabric while sewing an overedge stitch. 4,953,484, Cl. 112-162.000.

Fukao, Masami: *See*—
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Fukasawa, Masato: *See*—
Endo, Keiichi; Shinbo, Yasushi; Kageyama, Akira; Katsuya, Yasuo; Kato, Chihiro; Fukasawa, Masato; and Sekine, Makoto, 4,954,406, Cl. 430-60.000.

Fukuchi, Masakazu: *See*—
Morita, Shizuo; Matsumoto, Toru; Kamegamori, Masayuki; Hayakawa, Kazushi; Hatakeyama, Noboru; Matsuo, Shunji; and Fukuchi, Masakazu, 4,954,844, Cl. 355-260.000.

Fukuda, Hiroshi: *See*—
Nagai, Takeshi; Fukuda, Hiroshi; Itoh, Masahiko; and Shitaya, Takao, 4,954,694, Cl. 219-413.000.

Fukuda, Norisuke; and Shimada, Yuji, to Kabushiki Kaisha Toshiba. Canister vacuum cleaner with automatic operation control. 4,953,253, Cl. 15-319.000.

Fukushima, Nobuhiro; and Sawaki, Ippei, to Fujitsu Limited. Floating type magneto-optic disk reading head system having external semiconductor laser resonator operating at orthogonal two mode oscillations. 4,955,006, Cl. 369-13.000.

Fullemann, James S., to Merlin Instrument Company. Injection septum. 4,954,149, Cl. 55-386.000.

Funabashi, Takeshi: *See*—
Doi, Tetsuo; and Funabashi, Takeshi, 4,955,061, Cl. 382-56.000.

Funakoshi, Haruo, to Mitsubishi Denki Kabushiki Kaisha. Test method of an electrostatic breakdown of a semiconductor device and an apparatus therefor. 4,954,772, Cl. 324-158.00R.

Funakoshi, Yasutomo: *See*—
Ishii, Kazunori; Terakado, Seishi; Funakoshi, Yasutomo; and Sakairi, Tadashi, 4,954,696, Cl. 219-548.000.

Funatsu, Eiji: *See*—
Nakamura, Taku; Hirano, Tsumoru; Funatsu, Eiji; and Ishikawa, Shunichi, 4,954,417, Cl. 430-138.000.

Furuhata, Takashi; and Satoh, Kenji, to Hitachi, Ltd. Tracking control method and device in rotary head type magnetic recording and reproducing apparatus. 4,954,902, Cl. 360-10.200.

Furukawa, Kazunari, to Yamaha Corporation. Acoustic apparatus. 4,953,655, Cl. 181-160.000.

Furukimi, Osamu: *See*—
Takajo, Shigeaki; Furukimi, Osamu; Ogura, Kuniaki; Maruta, Keiichi; Abe, Teruyoshi; and Sakurada, Ichio, 4,954,171, Cl. 75-246.000.

Furusho, Noboru: *See*—
Sugata, Yoshinobu; Furusho, Noboru; and Tanaka, Tomomi, 4,954,405, Cl. 430-58.000.

Furuta, Yoshikazu. Fishhook and producing method of the same. 4,953,321, Cl. 43-43.160.

Furutsu, Etsuro; and Izukawa, Kazuhiro, to Canon Kabushiki Kaisha. Control circuit for a vibration wave motor. 4,954,741, Cl. 310-316.000.

Furuzawa, Richard: *See*—
Barnes, Bruce E.; Furuzawa, Richard; and Kahn, Paul, 4,954,251, Cl. 210-806.000.

Fuse, Noboru: *See*—
Aoki, Kazutsugu; Fuse, Noboru; and Sakamoto, Yoshio, 4,954,684, Cl. 219-390.000.

Fusion Systems Corporation: *See*—
Lynch, Donald; Kamarehi, Mohammad; Ury, Michael G.; and Wood, Charles H., 4,954,755, Cl. 315-248.000.
Wood, Charles H.; and Mosher, David, 4,954,756, Cl. 315-39.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Kohno, Naoichi; Arai, Masahiro; Aneha, Akira; and Fujisaki, Michio, 4,954,820, Cl. 340-825.690.

Futch, Max G.; and Drushel, Ronald H., to Max G. Futch. Self leveling dispenser. 4,954,760, Cl. 318-480.000.

G. D. Searle & Co.: *See*—
Djuric, Stevan W.; and Penning, Thomas D., 4,954,520, Cl. 514-467.000.

Gaag, Norbert; and Ruchel, Peter, to Diehl GmbH & Co. Precipitates copper-zinc alloy with nickel silicide. 4,954,187, Cl. 148-413.000.

Gabauer, Dale: *See*—
Klopfer, Walter; Haug, Fritz; Gabauer, Dale; and Workley, James, 4,954,777, Cl. 324-232.000.

Gabriel, Calvin T.; and Nulty, James E., to VLSI Technology, Inc. Endpoint detection system and method for plasma etching. 4,954,212, Cl. 156-627.000.

Gabrielsson, Per E. G.: *See*—
Flodman, Leif A.; and Gabrielsson, Per E. G., 4,954,581, Cl. 525-497.000.

Gadsby, Harold S. Inflatable pool cover. 4,953,239, Cl. 4-499.000.

GAF Chemical Corporation: *See*—
Vara, Fulvio J.; Dougherty, James A.; and Plotkin, Jeffrey S., 4,954,593, Cl. 526-270.000.

GAF Chemicals Corporation: *See*—
Chuang, Jui-Chang; Walls, Edward, Jr.; Johnson, Stephen C.; and Tazi, Mohammed, 4,954,336, Cl. 424-71.000.
Lewis, David F.; and Schenfele, Robert D., 4,954,428, Cl. 430-495.000.
Lewis, David F.; and Schenfele, Robert D., 4,954,543, Cl. 524-104.000.
Liu, Kou-Chang; and Taylor, Paul D., 4,954,582, Cl. 525-502.000.
Merianos, John J.; and Garelick, Paul, 4,954,636, Cl. 548-519.000.

Gaffney, John M.; Gelinas, Wilfred R.; Hern, Joel C.; and Krouse, Charles L., to Harris Graphics Corporation. System for continuously rotating plate a blanket cylinders at relatively different surface speeds. 4,953,461, Cl. 101-142.000.

Gaines, Lee R.; and Spector, George. Collar protector. 4,953,232, Cl. 2-60.000.

Galasko, Philip E.; and Kruger, Frans J., to Galasko, Philip Elliot. Transducer. 4,953,393, Cl. 73-146.500.

Galasko, Philip Elliot: *See*—
Galasko, Philip E.; and Kruger, Frans J., 4,953,393, Cl. 73-146.500.

Gale, Robert M., to Alza Corporation. Method for treating nocturnal angina. 4,954,344, Cl. 424-448.000.

Galgon, Randy A., to Hazleton Environmental Products, Inc. Water conditioning apparatus and method. 4,954,147, Cl. 55-53.000.

Galloway, Craig D. Masonry structure system. 4,953,332, Cl. 52-228.000.

Gamlen, Michael J. D.: *See*—
Jones, Harry P.; Mackey, Robert J.; and Gamlen, Michael J. D., 4,954,350, Cl. 424-493.000.

Gammon, Nathan A.: *See*—
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Gangloff, Richard: *See*—
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Kuchta, Richard; Billings, Larry; Evenzon, Vladimir; and Bristow, Donald, 4,953,469, Cl. 104-127.000.
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Meyers, Kenneth A., 4,953,737, Cl. 250-70.000.
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Goodman, Allan L. Repair kit for shower curtain and the like. 4,954,378, Cl. 428-63.000.
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Goto, Yozo, to Ohbayashi Corporation. Seismic isolator. 4,953,658, Cl. 181-207.000.
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Gould, Russell P. Intelligent archery sighting device. 4,953,302, Cl. 33-265.000.
Goussios, Theodore, to Inspiration Markets, Inc. Dual purpose lottery ticket and boarding pass. 4,953,895, Cl. 283-102.000.
Govan, Donald T. Line cutter for marine propellers. 4,954,108, Cl. 440-73.000.
Gowan, John W., Jr., to Westvaco Corporation. Preparation of polymers with pendant organic moieties bound thereto via ester and/or amide bridges. 4,954,566, Cl. 525-61.000.
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Gracie, Michael D., Sr.: *See*—
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Graebe, Robert H. Contoured seat base. 4,953,913, Cl. 297-459.000.
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Visser, James T., 4,953,381, Cl. 72-257.000.
Granqvist, Claes Goran, to HB Radicool Research & Development. Web material for camouflage against electromagnetic radiation. 4,953,922, Cl. 350-1.700.
Grant, Fred W. Mobile stretcher support. 4,953,886, Cl. 280-640.000.
Grant, Richard W.; and Storaasli, Allen G., to Hughes Aircraft Company. Apparatus for simultaneously rotating a plurality of parallel shafts. 4,954,832, Cl. 342-352.000.
Gras, Elie: *See*—
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Gregorich, Daniel A.; and Breining, Frank E., to Airmaster Fan Company. Unitary carton system for fans. 4,953,698, Cl. 206-319.000.
Greig, John M.; and Bowman, Jeremy A. Structures of plastics material. 4,954,299, Cl. 264-22.000.
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Griffin, Gary E.; and Krause, Walter O., to Parker Hannifin Corporation. Biflow filter drier. 4,954,252, Cl. 210-136.000.
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Grigsby, David A.: *See*—
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Grim, Tracy E.; and Haines, Jeffrey R., to Royce Medical Company. Cruciate ligament leg brace. 4,953,543, Cl. 128-80.00C.
Grimshaw, Michael N., to Cincinnati Milacron Inc. Presser member for contoured surfaces. 4,954,204, Cl. 156-361.000.
Gripp, Anna A.; and Metzler, Gottfried, III, to American Cyanamid Company. Novel shaving composition. 4,954,337, Cl. 424-73.000.
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Gross, Hagen: *See*—
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Grunkemeier, Hans W.: *See*—
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Gueret, Jean-Louis, to L'Oreal. Refillable dispenser including a translatable plunger. 4,954,000, Cl. 401-68.000.
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Guggenberger, Eduard: *See*—
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Guichard, Jean, to Messier-Hispano-Bugatti. Pulse generator for a rotary speed sensor. 4,954,737, Cl. 310-168.000.
Guigne, Jacques Y., to Nordco Limited. Areal sound intensity receiver. 4,955,001, Cl. 367-118.000.
Guirguis, Raouf A., to Cancer Diagnostics, Inc. Urine testing module and method of collecting urine antigen. 4,953,561, Cl. 128-771.000.
Gulbransen Incorporated: *See*—
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Gullett, Bradley T.: *See*—
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Stoppani, Brian R.; and Cummings, Norman, 4,953,692, Cl. 198-834.000.
Gummere, John B.: *See*—
Harmony, Daniel C.; Gummere, John B.; and Minney, Stephen C., 4,954,678, Cl. 219-10.430.
Gunma University: *See*—
Otani, Sugio; Kojima, Akira; and Ota, Michiya, 4,954,607, Cl. 528-230.000.
Guss, Paul A. Stringed musical instrument that can be played by two musicians simultaneously. 4,953,434, Cl. 84-263.000.
Guth, Paul S., to Tulane Educational Fund. Furosemide as tinnitus suppressant. 4,954,486, Cl. 514-158.000.
Guthrie, William L.: *See*—
Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, 4,954,142, Cl. 51-309.000.
Gutierrez, Antonio; and Lundberg, Robert D., to Exxon Chemical Patents Inc. Lactone modified adducts or reactants and oleaginous compositions containing same. 4,954,276, Cl. 252-49.600.
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Guttler, Hermann: *See*—
Schulz, Gunter; Probst, Frieder; and Guttler, Hermann, 4,953,350, Cl. 57-354.000.
Gutzeit, Horst: *See*—
Ziegler, Hermann; Handte, Horst; Braun, Walter; and Gutzeit, Horst, 4,953,331, Cl. 52-208.000.
Guyre, Paul M.: *See*—
Fanger, Michael W.; Guyre, Paul M.; and Anderson, Clark L., 4,954,617, Cl. 530-387.000.
Haarasilta, Asko; Vuorenlinna, Leo; and Laiho, Kalevi. Feed raw material and feed containing zero fibre and procedure for producing these. 4,954,355, Cl. 426-61.000.
Haarkosmetik and Parfumerien: *See*—
Samann, Heinz, 4,954,385, Cl. 428-131.000.
Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,953,453, Cl. 99-373.000.
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Apparatus for operating locks of baking tongs for producing rottable, preferably edible wafers from wafer dough in a wafer baking oven or an automatic wafer baking machine. 4,953,453, Cl. 99-373.000.
Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,953,453, Cl. 99-373.000.
Haberle, Friedrich: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,954,024, Cl. 408-153.000.
Habicht, Helmut. Method for aligning, lifting and tilting a container relative to a vertical aperture. 4,954,037, Cl. 414-389.000.
Hachiya, Satoshi, to Idemitsu Kosan Co., Ltd. Ferroelectric liquid-crystalline polymer and epoxide usable to preparation of the ferroelectric liquid-crystalline polymer. 4,954,600, Cl. 528-89.000.
Hacker, Thomas G.: *See*—
Yafuso, Masao; Yan, Cheng F.; Hacker, Thomas G.; Hui, Henry K.; Maxwell, Thomas P.; and Miller, William W., 4,954,318, Cl. 422-59.000.
Hacowie Corporation: *See*—
Savage, Charles; Barone, Frank G., Jr.; Demetrious, Gregory; and Volpe, Vincent, 4,954,958, Cl. 364-444.000.
Hafen, Martin: *See*—
Ebert, Wolfram; Handrich, Eberhard; Hafen, Martin; and Ryrko, Bruno, 4,953,834, Cl. 267-160.000.
Hafner, Hans-Ulrich: *See*—
Forth, Hans-Joachim; and Hafner, Hans-Ulrich, 4,953,359, Cl. 62-55.500.
Haga, Toru: *See*—
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Hagan, Grant E. Flue control device. 4,953,535, Cl. 126-307.00R.
Hagiwara, Naoki: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.
Hagiwara, Toshihiko: *See*—
Nakamura, Kazunari; Hagiwara, Toshihiko; and Takano, Akira, 4,953,539, Cl. 128-6.000.
Hagiya, Koji: *See*—
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,954,651, Cl. 562-856.000.
Hahn, Peter; Piontek, Hubert; Schnegg, Anton; and Zulehner, Werner, to Wacker-Chemitronic Gesellschaft fur Elektronic-Grundstoffe mbH. Silicon wafers for producing oxide layers of high breakdown strength and process for the production thereof. 4,954,189, Cl. 148-33.200.
Haines, Jeffrey R.: *See*—
Grim, Tracy E.; and Haines, Jeffrey R., 4,953,543, Cl. 128-80.00C.
Haishi, Akira: *See*—
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.
Halbert, Thomas R.; Wei, Liwen; and Stiefel, Edward I., to Exxon Research and Engineering Company. Dithiocicd rhenium sulfide dimer compositions. 4,954,645, Cl. 556-45.000.
Hales, Walter L., to United States of America, Army. Lateral-shearing electro-optic field sensor. 4,953,981, Cl. 356-353.000.
Haliburton Company: *See*—
Hamid, Syed; Lucas, Jackie K.; and Lockman, Russell R., 4,953,618, Cl. 166-250.000.
Hall, Ralph F.: *See*—
Gleason, John G.; Hall, Ralph F.; and Smallheer, Joanne, 4,954,513, Cl. 514-381.000.
Hall, Thomas D.: *See*—
Wallis, Philip; Burkhalter, Robert E.; and Hall, Thomas D., 4,954,002, Cl. 401-217.000.
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., to Rohm and Haas Company. Imide polymers. 4,954,574, Cl. 525-327.600.
Halliburton Geophysical Services, Inc.: *See*—
Edington, Bruce L., 4,953,657, Cl. 181-111.000.
Halpaap, Reinhard: *See*—
Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, 4,954,577, Cl. 525-420.000.
Halpern, Alfred, deceased: *See*—
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.
Halpern, Marjorie A., administratrix: *See*—
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.
Hamada, Masaki: *See*—
Shirasaka, Akifumi; Seto, Kunio; Hamada, Masaki; and Shibuya, Yukari, 4,955,064, Cl. 382-22.000.
Hamanaka, Toshiyuki: *See*—
Ito, Toshikazu; Harada, Takashi; and Hamanaka, Toshiyuki, 4,953,627, Cl. 165-8.000.
Hamano, Toshikatsu: *See*—
Aoki, Yoshiharu; and Hamano, Toshikatsu, 4,954,262, Cl. 210-638.000.
Hambright, Perry N. Handicraft for producing simulated needlepoint. 4,953,370, Cl. 68-213.000.
Hamid, Syed; Lucas, Jackie K.; and Lockman, Russell R., to Haliburton Company. Injection manifold and method. 4,953,618, Cl. 166-250.000.
Hamisch, Paul H., Jr.; and Makley, James A., to Monarch Marking Systems, Inc. Hand-held labeller. 4,954,208, Cl. 156-577.000.
Hammer, Joe K.; Fitzsimmons, Alan H.; and Greutmann, Hans, to Prestolite Electric Incorporated. Method for retaining a magnet within a motor assembly. 4,953,284, Cl. 29-596.000.
Hammond, Douglas S.; and Odle, Herbert A., to Holophane Company, Inc. Lighting system for illuminating billboards and the like. 4,954,935, Cl. 362-245.000.
Hamner, Jeffrey W.; and Schiviey, George P., Jr., to Ingersoll-Rand Company. Closed loop hydraulic drill feed system. 4,953,639, Cl. 175-203.000.
Hamuro, Mitsuro: *See*—
Higuchi, Hirokazu; and Hamuro, Mitsuro, 4,954,207, Cl. 156-552.000.
Hanabusa, Kazuhito: *See*—
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.
Hanagan, Michael W., to Corbin Pacific. Convertible seat for motorcycle. 4,953,911, Cl. 297-195.000.

Hanamori, Toshihiro: *See*—
Akutagawa, Ichiro; Yamaguchi, Tsutomu; Hanamori, Toshihiro; Matsuzaki, Kunimitsu; and Okamura, Shinobu, 4,954,602, Cl. 528-93.000.
Handa, Junichi: *See*—
Ito, Hiroshi; Handa, Junichi; Takagi, Yoshio; and Minohara, Taketoshi, 4,954,175, Cl. 106-417.000.
Handrich, Eberhard: *See*—
Ebert, Wolfram; Handrich, Eberhard; Hafen, Martin; and Ryrko, Bruno, 4,953,834, Cl. 267-160.000.
Handte, Horst: *See*—
Ziegler, Hermann; Handte, Horst; Braun, Walter; and Gutzeit, Horst, 4,953,331, Cl. 52-208.000.
Handy, Allen L.: *See*—
Krubsack, Larry J.; Lawton, John G.; and Handy, Allen L., 4,953,420, Cl. 70-366.000.
Hanes, Lewis F.: *See*—
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Hankamp B.V.: *See*—
Seroo, Jan M.; Cuypers, Martinus H.; and Oude Maatman, Anthonius J. H. M., 4,954,028, Cl. 409-26.000.
Hansen, Albert F., to Hansen Developments Limited. Water spray fitting. 4,953,788, Cl. 239-107.000.
Hansen Developments Limited: *See*—
Hansen, Albert F., 4,953,788, Cl. 239-107.000.
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., to Minnesota Mining and Manufacturing Company. Use of sorbent sheet materials as evaporative coolants. 4,953,544, Cl. 128-156.000.
Hara, Akira, to B-J Trading Limited. Cleaning apparatus for a cylinder. 4,953,463, Cl. 101-425.000.
Hara, Hiroshi: *See*—
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.
Hara, Kazuhiko; Takahashi, Toshiaki; and Nagura, Masato, to Canon Kabushiki Kaisha. Ultrasonic measuring apparatus for measuring a predetermined boundary surface inside an object. 4,953,405, Cl. 73-602.000.
Harada, Hiroyuki; and Kajitani, Tetsuji, to Mita Industrial Co., Ltd. Image forming apparatus. 4,954,863, Cl. 355-51.000.
Harada, Koukichi: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.
Harada, Takashi: *See*—
Ito, Toshikazu; Harada, Takashi; and Hamanaka, Toshiyuki, 4,953,627, Cl. 165-8.000.
Harada, Terumaru: *See*—
Inoda, Kenichi; and Harada, Terumaru, 4,954,053, Cl. 417-379.000.
Harada, Tsutomu; and Shikano, Hiroshi, to Kurosaki Refractories Co., Ltd. High-durability plate brick for sliding gate nozzle apparatus. 4,954,535, Cl. 523-139.000.
Haraga, Kousuke: *See*—
Satou, Hiroshi; Utsui, Yoshihiko; Tuneyoshi, Kiyotugu; Taniguchi, Takashi; Haraga, Kousuke; and Tsukui, Keitarou, 4,954,215, Cl. 156-630.000.
Haragashira, Motoji; and Maekawa, Yoshimi, to Kabushiki Kaisha Toshiba. Switch for high magnetic field. 4,954,924, Cl. 361-187.000.
Harbor Branch Oceanographic Institution, Inc.: *See*—
Wright, Amy E.; Thompson, Winnie C.; and Lui, May S., 4,954,527, Cl. 514-675.000.
Harmon, Peter P.: *See*—
Bloss, Karl H.; and Harmon, Peter P., 4,954,367, Cl. 427-109.000.
Harmony, Daniel C.; Gummere, John B.; and Minney, Stephen C., to Engineering & Research Associates, Inc. Annular RF sealer and method. 4,954,678, Cl. 219-10.430.
Harms, Frank M.; Tripp, Victor; and Wells, Thomas B., to Lifeblood Advanced Blood Bank Systems, Inc. Method for the rapid thawing of cryopreserved blood, blood components, and tissue. 4,954,679, Cl. 219-10.55M.
Harnischfeger Corporation: *See*—
Foit, Vilem, 4,953,721, Cl. 212-147.000.
Harrel, Inc.: *See*—
Harris, Holton E., 4,954,719, Cl. 250-560.000.
Harris, Anne, to Harris, Anne. Padded flare-back sofa. 4,953,242, Cl. 5-18.100.
Harris Corporation: *See*—
Baird, Charles A.; and Collins, Noel, 4,954,837, Cl. 342-458.000.
Harris Graphics Corporation: *See*—
Gaffney, John M.; Gelinas, Wilfred R.; Hern, Joel C.; and Krouse, Charles L., 4,953,461, Cl. 101-142.000.
Harris, Holton E., to Harrel, Inc. Sheet thickness gauging method and system with auto calibration. 4,954,719, Cl. 250-560.000.
Harrison, Cecil P.; and Tittle, Cullen G., to Tennessee Valley Authority. Agglomeration of gypsum, limestone, or gypsum-limestone mix. 4,954,134, Cl. 23-313.00R.
Harsco Corporation: *See*—
Bartuski, William A., 4,953,442, Cl. 89-36.020.
Hart, W. Howard: *See*—
Bott, Steven E.; and Hart, W. Howard, 4,953,978, Cl. 356-336.000.
Hartridge, Leonard S. G.; Taylor, David W.; and Waters, Roger L., to Imperial Chemical Industries PLC. Coating compositions. 4,954,368, Cl. 427-256.000.
Hartwell, Carol. Food rack cover. 4,954,384, Cl. 428-100.000.
Harvey, Ronald J.: *See*—
Irvin, Ronald D.; Burkett, David; Kaplan, David E.; and Harvey, Ronald J., 4,954,046, Cl. 417-53.000.
Hasbro, Inc.: *See*—
Keska, Tadeusz, 4,953,785, Cl. 238-10.00A.
Hasebe, Akihiko: *See*—
Sako, Ryohsuke; Hasebe, Akihiko; Nishihara, Akira; and Okita, Hiroshi, 4,954,372, Cl. 427-388.200.
Hasegawa, Kazumi; Ikeda, Hiroshi; and Ito, Wataru, to Citizen Watch Co., Ltd. Tractor units for push-pull printer. 4,953,997, Cl. 400-616.300.
Hasegawa, Kenji; Mori, Takahiro; and Higuma, Masahiko, to Canon Kabushiki Kaisha. Recording medium. 4,954,395, Cl. 428-318.400.
Hasegawa, Yoshio: *See*—
Okamura, Kiyohito; Sato, Mitsuhiko; Hasegawa, Yoshio; Seguchi, Tadao; and Kawanishi, Shunichi, 4,954,461, Cl. 501-95.000.
Hashida, Koichi; and Kohno, Teruhisa, to Sumitomo Electric Industries Ltd. Modulator for use in an anti-lock brake control system. 4,953,918, Cl. 303-115.000.
Hashimoto, Isao; and Hidehira, Tsuyoshi, to Taxmo Co., Ltd. Diamond pen type marking device for substrates. 4,954,842, Cl. 346-139.00R.
Hashimoto, Kenji: *See*—
Osumi, Toru; Ito, Shoji; and Hashimoto, Kenji, 4,953,825, Cl. 251-129.170.
Hashimoto, Masahi, to Texas Instruments Incorporated. FIFO memory capable of simultaneously selecting a plurality of word lines. 4,954,994, Cl. 365-230.060.
Hashimoto, Masashi: *See*—
Oku, Teruo; Kasahara, Ciyoshi; Ohkawa, Takehiko; and Hashimoto, Masashi, 4,954,496, Cl. 514-231.500.
Hashimoto, Shigeaki: *See*—
Maekawa, Junichi; Abe, Masanori; Ienaga, Hirofumi; and Hashimoto, Shigeaki, 4,953,910, Cl. 296-223.000.
Hashimoto, Yasushi: *See*—
Sasaki, Akira; Esaki, Seiji; Hashimoto, Yasushi; and Kurita, Shigeo, 4,954,119, Cl. 464-111.000.
Hashizume, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus of internal combustion engine. 4,953,520, Cl. 123-631.000.
Hashizume, Junichiro; Takei, Tetsuya; Iida, Shigehira; Saitoh, Keishi; and Arai, Takayoshi, to Canon Kabushiki Kaisha. Microwave plasma CVD apparatus having substrate shielding member. 4,953,498, Cl. 118-719.000.
Hashizume, Nobuyuki: *See*—
Oguro, Katsunori; Nojima, Hiroshi; Hashizume, Nobuyuki; Ohno, Norio; and Naito, Taketoshi, 4,954,512, Cl. 514-352.000.
Haskell, Jacob D.: *See*—
Avanzino, Steven C.; and Haskell, Jacob D., 4,954,459, Cl. 437-228.000.
Hassler, William L., Jr., to Parker Hannifin Corporation. Linear diffuse light source. 4,954,931, Cl. 362-32.000.
Hasty, Charles E. Air-operated body support device. 4,953,247, Cl. 5-453.000.
Hatakeyama, Noboru: *See*—
Morita, Shizuo; Matsumoto, Toru; Kamegamori, Masayuki; Hayakawa, Kazushi; Hatakeyama, Noboru; Matsuo, Shunji; and Fukuchi, Masakazu, 4,954,844, Cl. 355-260.000.
Hatayama, Tadahiro: *See*—
Ohmi, Tadahiro; Kanno, Yohichi; Satoh, Kazuhiko; and Hatayama, Tadahiro, 4,953,826, Cl. 251-331.000.
Hatch, Bruce O., to Thermal Dynamics Corporation. Plasma arc gouger. 4,954,683, Cl. 219-121.500.
Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, to Tokyo Electric Power Company Ltd., The; and Sumitomo Electric Industries, Ltd. Mobile communication system. 4,955,082, Cl. 455-33.000.
Haug, Fritz: *See*—
Klopfer, Walter; Haug, Fritz; Gabauer, Dale; and Workley, James, 4,954,777, Cl. 324-232.000.
Haug, Richard J. Shock absorbant heel. 4,953,310, Cl. 36-38.000.
Hayakawa, Kazunobu: *See*—
Matsuyama, Hideo; Koike, Kazuyuki; and Hayakawa, Kazunobu, 4,954,770, Cl. 324-71.300.
Hayakawa, Kazushi: *See*—
Morita, Shizuo; Matsumoto, Toru; Kamegamori, Masayuki; Hayakawa, Kazushi; Hatakeyama, Noboru; Matsuo, Shunji; and Fukuchi, Masakazu, 4,954,844, Cl. 355-260.000.
Hayashi, Hideharu: *See*—
Ozaki, Keiichi; Manabe, Naoki; Shibata, Tatsumi; Hayashi, Hideharu; Muramatsu, Yukio; and Yamamoto, Masaki, 4,954,102, Cl. 439-535.000.
Hayashi, Kenji: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.
Hayashi, Kiyoshi: *See*—
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Hayashi, Munekazu: *See*—
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Hayashi, Nobuatsu; Takahashi, Sankichi; Ebara, Katsuya; Kurokawa, Hideaki; Yamada, Akira; Koseki, Yasuo; Matsuzaki, Harumi; and

Yoda, Hiroaki, to Hitachi, Ltd. Distilling apparatus. 4,953,694, Cl. 202-180.000.
Hayashi, Ryutaro: *See*—
Ishikawa, Kanzo; Hayashi, Ryutaro; and Yoshimoto, Akira, 4,954,681, Cl. 219-10.55A.
Hayashi, Yoshinori: *See*—
Iijima, Kenzaburou; and Hayashi, Yoshinori, 4,954,803, Cl. 338-32.00R.
Hayes, Edward C.: *See*—
Young, Robert N.; Rokach, Joshua; and Hayes, Edward C., 4,954,638, Cl. 548-546.000.
Hazleton Environmental Products, Inc.: *See*—
Galgon, Randy A., 4,954,147, Cl. 55-53.000.
HB Radicool Research & Development: *See*—
Granqvist, Claes Goran, 4,953,922, Cl. 350-1.700.
Healey, Peter, to British Telecommunications plc. Operating a multiple-access optical network. 4,955,013, Cl. 370-1.000.
Heath Consultants Incorporated: *See*—
Jacob, Allan S.; and Zawadzki, Andrzej, 4,954,973, Cl. 364-551.010.
Heckt, Neil W., to Boeing Company, The. Apparatus and method for compressing a video signal. 4,954,879, Cl. 358-13.000.
Hedman, Jonathan W.: *See*—
Blackmer, Richard H.; and Hedman, Jonathan W., 4,953,546, Cl. 128-203.160.
Hegdahl, Randy A. High security keeper and reinforcement bar for entry door. 4,953,901, Cl. 292-340.000.
Hehn, Ronald L.: *See*—
Chapman, William L.; Marner, Charles F.; Schotter, Daniel K.; and Hehn, Ronald L., 4,953,422, Cl. 74-526.000.
Heidtmann, Heinrich. Boat carrousel. 4,953,488, Cl. 114-44.000.
Heijkoop, Teunis: *See*—
Sare, Ian R.; Henderson, Ian; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,953,612, Cl. 164-102.000.
Heil Co., The: *See*—
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Smith, Fred T.; and Smith, Fred P., 4,954,040, Cl. 414-513.000.
Heinemann, Joachim: *See*—
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Heinrich-Hertz-Institut fur Nachrichtentechnik Berlin GmbH: *See*—
Mayer, Stefan; and Schmidt, Susanne, 4,954,896, Cl. 358-234.000.
Heinrich, Peter; and Moerker, Theophile, to Ciba-Geigy Corporation. Process for the selective N-acylation of aminohydroxamic acid derivatives and starting materials used therein. 4,954,634, Cl. 548-341.000.
Heise, Hartmut; and Hintzmann, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of o-nitrophenetole. 4,954,657, Cl. 568-584.000.
Heki, Tatsuo: *See*—
Inoue, Noriyuki; Kojima, Tetsuro; Heki, Tatsuo; and Hirano, Shigeo, 4,954,427, Cl. 430-409.000.
Helbawi, Salah. Automatic reverse vending machine for aluminum can recycling. 4,953,682, Cl. 194-208.000.
Helena Laboratories: *See*—
Sarrine, Robert J.; Garsee, Henry A.; Kelley, Charles D.; and Guadagno, Philip A., 4,954,237, Cl. 204-299.00R.
Helene Curtis, Inc.: *See*—
Janchipraponvej, Ben, 4,954,335, Cl. 424-070.000.
Helie, Simon. Truck trailer hitch. 4,953,883, Cl. 280-477.000.
Hellman, Stig, to Akerlund & Rausing Licens Aktiebolag. Machine for packaging flat, unsymmetrical objects. 4,953,343, Cl. 53-500.000.
Helm, P. Ralph: *See*—
Becker, Thomas K.; Casavant, Terry S.; Helm, P. Ralph; Petzold, Terry L.; Wanek, Michael J.; and Zuehlke, Art G, 4,953,722, Cl. 212-156.000.
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., to Hoechst-Roussell Pharmaceuticals Inc. 4-pentafluorophenoxypiperidines. 4,954,511, Cl. 514-327.000.
Henderson, Ian: *See*—
Sare, Ian R.; Henderson, Ian; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., 4,953,612, Cl. 164-102.000.
Hendricks, Donald M.: *See*—
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Hendy, Brian N.: *See*—
Scott, Graham W.; Gough, Paul; Hendy, Brian N.; and Cinderey, Michael B., 4,954,143, Cl. 55-16.000.
Henkel Corporation: *See*—
Staker, Doanld D.; and Kain, William S., 4,954,363, Cl. 426-636.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Carduck, Franz-Josef; Falbe, Juergen; Fleckenstein, Theo; Goebel, Gerd; and Pohl, Joachim, 4,954,664, Cl. 568-864.000.
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Hennessey, Robert: *See*—
Hill, Edward W. D.; Buckley, William P.; and Hennessey, Robert, 4,954,086, Cl. 439-65.000.
Hennessy, J. P.: *See*—
Spainhour, Phillip A., 4,953,296, Cl. 33-203.180.
Henry, Beverly A., administratrix: *See*—
Natusch, Paul J.; Yu, Eugene L.; Senerchia, David C.; and Henry, John F., Jr., deceased, 4,954,946, Cl. 364-200.000.
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Hensley, Albert L., Jr.: *See*—
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Lee, Robert D.; Mounger, Robert W.; and Heptig, John P., 4,955,038, Cl. 375-35.000.
Herdies, Julien. Transformable tool-box. 4,953,601, Cl. 144-285.000.
Hermann Pfauter GmbH & Co.: *See*—
Faulstich, Ingo, 4,954,027, Cl. 409-26.000.
Hermans, Willem F., to Stork Amsterdam B.V. Apparatus for keeping at a determined temperature a product mixture consisting of a liquid containing solid pieces. 4,953,633, Cl. 165-109.100.
Hern, Joel C.: *See*—
Gaffney, John M.; Gelinas, Wilfred R.; Hern, Joel C.; and Krouse, Charles L., 4,953,461, Cl. 101-142.000.
Herrell, Dennis J.: *See*—
Nelson, Richard D.; and Herrell, Dennis J., 4,953,634, Cl. 165-147.000.
Herrmann, Karl H., to Nova-Tech Engineering, Inc. Personnel door for a RF shielded room. 4,953,324, Cl. 49-255.000.
Herrmann, Rupert: *See*—
Klein, Christian; Batz, Hans-Georg; and Herrmann, Rupert, 4,954,630, Cl. 544-102.000.
Herse, Klaus: *See*—
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Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, to Heumann Pharma GmbH & Co. Piperazine substituted 6-phenyldihydro-3(2H)-pyridazinones, and pharmaceutical preparations containing these. 4,954,501, Cl. 514-252.000.
Herzke, Harry, to Ernst Siegling, Firma. Conveyor with slippage stops on the conveyor surface. 4,953,690, Cl. 198-690.200.
Hesse, Alfons: *See*—
Puttmann, Franz-Josef; and Hesse, Alfons, 4,953,626, Cl. 173-91.000.
Hesselink, Lambertus: *See*—
Redfield Stephen R.; and Hesselink, Lambertus, 4,953,924, Cl. 350-3.640.
Hester, Gary: *See*—
Rogers, Steven A.; Bockelmann, George; and Hester, Gary, 4,954,839, Cl. 346-76.0PH.
Hester, Troy L., to United States of America, Army. Active lag angle device. 4,953,804, Cl. 242-47.000.
Hettich, Gerhard: *See*—
Alberter, Gunther; Deeg, Helmut; Hettich, Gerhard; Neidhard, Klaus; Schmid, Hans-Dieter; and Schrumpf, Hans, 4,954,677, Cl. 200-834.000.
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Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 4,954,501, Cl. 514-252.000.
Hewlett-Packard Company: *See*—
Frankenreiter, Michael; Rometsch, Rainer; and Seher, Jens-Peter, 4,953,557, Cl. 128-677.000.
Koenig, Mary K., 4,954,791, Cl. 332-164.000.
West, William J.; Taub, Howard H.; and Miller, Robert J., 4,953,287, Cl. 29-611.000.
Hibert, Marcel; and Gittos, Maurice W., to Merrell Dow Pharmaceuticals Inc. Aromatic 2-aminoalkyl-1,2-benzoisothiazol-3(2H)one-1,1-dioxide derivatives. 4,954,500, Cl. 514-249.000.
Hibino, Keiichi: *See*—
Yamada, Yukifumi; Terada, Takami; and Hibino, Keiichi, 4,953,676, Cl. 192-8.00C.
Hickey, Deirdre M. B.: *See*—
Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., 4,954,339, Cl. 424-78.000.
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Hidenori, Sugiyama: *See*—
Miyamoto, Tsutomu; Igarashi, Hisanaga; and Hidenori, Sugiyama, 4,954,530, Cl. 514-718.000.
Hiepe-Wohlleben, Kate: *See*—
Kuppers, Dieter; Herse, Klaus; Hiepe-Wohlleben, Kate; Kaiser, Manfred; Mohr, Friedemann; and Ohnsorge, Horst, 4,955,014, Cl. 370-3.000.
Higashi, Takao: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.
Higeta, Akira: *See*—
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Highfill, Robert R. Interactive image projection apparatus. 4,953,971, Cl. 353-122.000.

Hightower, Ralph E., to United States of America, Navy. Flexible mine case. 4,953,465, Cl. 102-406.000.

Higuchi, Hideyo: *See*—
Yoshida, Kazuomi; Higuchi, Hideyo; Mizuochi, Hitoshi; and Yamamoto, Yousuke, 4,954,853, Cl. 357-17.000.

Higuchi, Hirokazu; and Hamuro, Mitsuro, to Murata Manufacturing Co., Ltd. Apparatus for automatically taping electronic components. 4,954,207, Cl. 156-552.000.

Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, to Sanden Corporation. Wobble plate type compressor with variable displacement mechanism. 4,954,050, Cl. 417-269.000.

Higuchi, Yoshiki: *See*—
Suyama, Shuji; and Higuchi, Yoshiki, 4,954,656, Cl. 568-567.000.

Higuma, Masahiko: *See*—
Hasegawa, Kenji; Mori, Takahiro; and Higuma, Masahiko, 4,954,395, Cl. 428-318.400.

Hihaisuto Seiko Kabushiki Kaisha: *See*—
Hirose, Kazuya, 4,953,418, Cl. 74-424.80A.

Hijikata, Kenji: *See*—
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Naka, Michiro, 4,954,540, Cl. 524-86.000.
Nakane, Toshio; Kageyama, Yukihiko; Konuma, Hiroaki; and Hijikata, Kenji, 4,954,541, Cl. 524-86.000.

Hijuelos, Humberto A.: *See*—
Baran, Ireneusz W.; and Hijuelos, Humberto A., 4,954,682, Cl. 219-76.140.

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Maeda, Kouzo; Yoshioka, Masanobu; and Hikone, Makoto, 4,953,423, Cl. 74-552.000.

Hilal, Mohamed A., to General Dynamics Corp., Space Systems Division. Hybrid transformer current zero switch. 4,954,727, Cl. 307-112.000.

Hill, Edward W. D.; Buckley, William P.; and Hennessey, Robert, to Burndy Corporation. Float/guide member for card edge connector. 4,954,086, Cl. 439-65.000.

Hill, Godfrey R.; Smith, David W.; and Hunkin, David J., to British Telecommunications public limited company. Frequency locking radiation beam. 4,955,026, Cl. 372-18.000.

Hill, Lawrence I.: *See*—
Acharya, Ramadas U.; and Hill, Lawrence I., 4,954,389, Cl. 428-212.000.

Hill-Rom Company, Inc.: *See*—
Koerber, Clement J., Sr.; and Boyd, Howard J., 4,953,244, Cl. 5-60.000.

Hill, William E.: *See*—
Jewell, Raymond S., Jr.; and Hill, William E., 4,953,660, Cl. 181-282.000.

Hiltyon, Allan R.; and Mathews, Phillip. Ladder attachment. 4,953,661, Cl. 182-120.000.

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Hino, Haruki: *See*—
Nishiyama, Yukio; Fujioka, Junzo; Hino, Haruki; Matsuzaki, Yuji; Sakiyama, Masayuki; and Yokoyama, Minoru, 4,954,314, Cl. 419-45.000.

Hintzmann, Manfred: *See*—
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Hira, Gerald M.; Sheahen, Dana M.; Wilson, Pamela L.; and Nolan, Michael P., to Motorola, Inc. Microprocesor operating system for sequentially executing subtasks. 4,954,948, Cl. 364-200.000.

Hirabayashi, Hiromitsu: *See*—
Yano, Kanji; Saijo, Yasutsugu; Kusaka, Kensaku; and Hirabayashi, Hiromitsu, 4,954,845, Cl. 355-290.000.

Hirai, Nobuyuki: *See*—
Obitsu, Takeo; Ohnishi, Yutaka; Yoshinaka, Shinji; Koguchi, Minoru; Yanagita, Mitsuhiro; and Hirai, Nobuyuki, 4,954,631, Cl. 546-15.000.

Hirako, Shinichi, to Omron Tateisi Electronics Company. Optical system for signal light detection in a flow particle analysis apparatus. 4,953,979, Cl. 356-338.000.

Hirano, Nagayoshi: *See*—
Katsuma, Toshiaki; and Hirano, Nagayoshi, 4,953,958, Cl. 350-425.000.

Hirano, Shigeo: *See*—
Inoue, Noriyuki; Kojima, Tetsuro; Heki, Tatsuo; and Hirano, Shigeo, 4,954,427, Cl. 430-409.000.

Hirano, Tsumoru: *See*—
Nakamura, Taku; Hirano, Tsumoru; Funatsu, Eiji; and Ishikawa, Shunichi, 4,954,417, Cl. 430-138.000.

Hirasawa, Masahide, to Canon Kabushiki Kaisha. Reproducing apparatus having a mechanism for compensating time-base fluctuations. 4,954,911, Cl. 358-323.000.

Hirasawa, Yasuo: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.

Hirashima, Atsushi: *See*—
Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, 4,954,586, Cl. 526-245.000.

Hirata, Haruhiko, to Kabushiki Kaisha Toshiba. Nuclear magnetic resonance imaging apparatus with reduced acoustic noise. 4,954,781, Cl. 324-318.000.

Hironaka, Yoshiaki; Matsubayashi, Tatsuhiko; Kamata, Yoshikiyo; and Tasaki, Takanobu, to Kioritz Corporation. Portable work machine. 4,953,526, Cl. 123-182.000.

Hirose, Kazuya, to Hihaisuto Seiko Kabushiki Kaisha. Linear feed mechanism. 4,953,418, Cl. 74-424.80A.

Hirota, Taisuke: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.

Hirota, Takao: *See*—
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Hirota, Takato: *See*—
Kasahara, Mitsuharu; Kogawa, Kuniyuki; and Hirota, Takato, 4,954,798, Cl. 335-161.000.

Hirotsu, Tohru: *See*—
Shinnai, Masao; Nishikawa, Kazuya; Tsukada, Tokio; and Hirotsu, Tohru, 4,954,797, Cl. 343-704.000.

Hitachi Automotive Engineering, Inc.: *See*—
Sasaki, Masahiro; Abe, Osamu; and Ishikawa, Hideaki, 4,953,513, Cl. 123-489.000.

Hitachi Cable, Ltd.: *See*—
Imoto, Katsuyuki; Sano, Hirohisa; Miyazaki, Masaru; Matsuoka, Naoyuki; and Uetsuka, Hisato, 4,953,934, Cl. 350-96.150.

Hitachi Chemical Company, Ltd.: *See*—
Endo, Keiichi; Shinbo, Yasushi; Kageyama, Akira; Katsuya, Yasuo; Kato, Chihiro; Fukasawa, Masato; and Sekine, Makoto, 4,954,406, Cl. 430-60.000.
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.

Hitachi Keiyo Engineering Co., Ltd.: *See*—
Miyake, Norihisa; Sumita, Masaki; and Sarugaku, Shinichi, 4,954,762, Cl. 318-568.190.

Hitachi, Ltd.: *See*—
Akimoto, Hajime; and Ohba, Shinya, 4,954,895, Cl. 358-213.110.
Furuhata, Takashi; and Satoh, Kenji, 4,954,902, Cl. 360-10.200.
Hayashi, Nobuatsu; Takahashi, Sankichi; Ebara, Katsuya; Kurokawa, Hideaki; Yamada, Akira; Koseki, Yasuo; Matsuzaki, Harumi; and Yoda, Hiroaki, 4,953,694, Cl. 202-180.000.
Imoto, Katsuyuki; Sano, Hirohisa; Miyazaki, Masaru; Matsuoka, Naoyuki; and Uetsuka, Hisato, 4,953,934, Cl. 350-96.150.
Kaijima, Ryota; Ihara, Hirokazu; Nitta, Yoshihiko; and Kaji, Hiroyuki, 4,954,984, Cl. 364-900.000.
Kawasaki, Ikuya; Kurakazu, Keiichi; and Maejima, Hideo, 4,954,943, Cl. 364-200.000.
Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.
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Manaka, Toshio; and Shida, Masami, 4,953,530, Cl. 123-399.000.
Masuda, Satoshi; Kawasaki, Ikuya; and Matsui, Shigezumi, 4,954,942, Cl. 364-200.000.
Matsuyama, Hideo; Koike, Kazuyuki; and Hayakawa, Kazunobu, 4,954,770, Cl. 324-71.300.
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, 4,954,855, Cl. 357-23.700.
Mizuhara, Noboru; Tohru, Hoshi; and Morita, Takashi, 4,955,019, Cl. 370-85.700.
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; Ogawa, Taro; and Kimura, Takeshi, 4,954,424, Cl. 430-323.000.
Nagano, Masami; and Atago, Takeshi, 4,953,532, Cl. 123-419.000.
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.
Nakanishi, Keiichirou; Yamada, Minoru; Yamamoto, Masakazu; Ogihara, Satoru; Shinohara, Hiroichi; and Suzuki, Hideo, 4,954,877, Cl. 357-80.000.
Nishida, Tetsuya; Terao, Motoyasu; Miyauchi, Yasushi; and Horigome, Shinkichi, 4,954,379, Cl. 428-64.000.
Saeki, Junichi; Kaneda, Aizo; and Nishi, Kunihiko, 4,954,301, Cl. 264-40.100.
Sasaki, Masahiro; Abe, Osamu; and Ishikawa, Hideaki, 4,953,513, Cl. 123-489.000.
Takahashi, Tetsuhiko; Okajima, Kenichi; and Takeuchi, Hiroshi, 4,954,706, Cl. 250-327.200.
Tanaka, Hirotoshi; Yamashita, Hiroki; Masuda, Noboru; Shigeta, Junji; Umemoto, Yasunari; and Kagaya, Osamu, 4,954,866, Cl. 357-45.000.
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Hitachi, Ltd: *See*—
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Hitachi Microsoftware Systems, Inc.: *See*—
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.

Hitney, Herbert V.: *See*—
Olson, Jack R.; Hitney, Herbert V.; Paulus, Richard A.; and Anderson, Kenneth D., 4,953,986, Cl. 374-136.000.

Ho, Vu Quoc, to Northern Telecom Limited. Method for making interconnect structures for VLSI devices. 4,954,214, Cl. 156-628.000.

Hoberman, Barry A.: *See*—
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Hochin, Andre : *See*—
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Hoechst Aktiengesellschaft: *See*—
Aigner, Rudolf; Muller, Gunther; Muller, Rainer; and Reuner, Horst, 4,954,646, Cl. 558-31.000.
Heise, Hartmut; and Hintzmann, Manfred, 4,954,657, Cl. 568-584.000.
Koch, Volker; Schnatterer, Stefan; Bonin, Werner; Kern, Manfred; Knauf, Werner; and Waltersdorfer, Anna, 4,954,529, Cl. 514-594.000.
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, 4,954,594, Cl. 526-320.000.
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Hoechst Celanese Corp.: *See*—
Chen, Paul N., Sr.; and Vora, Rohitkumar H., 4,954,610, Cl. 528-350.000.
Chen, Paul N., Sr.; and Vora, Rohitkumar H., 4,954,611, Cl. 528-353.000.
Collins, George L.; Kim, Hongkyu; and Pleban, William M., 4,954,400, Cl. 428-414.000.
Deeg, Martin H. G., 4,954,605, Cl. 528-125.000.
East, Anthony J., 4,954,288, Cl. 252-299.010.
Fritch, John R.; Fruchey, Olan S; and Horlenko, Theodore, 4,954,652, Cl. 564-223.000.
Swofford, Howard W.; Rice, Sandra W.; Farrar, Grover L.; and Rudd, David, 4,954,396, Cl. 428-340.000.
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Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Strupczewski, Joseph T.; and Bordeau, Kenneth J., 4,954,503, Cl. 514-254.000.

Hoechst-Roussell Pharmaceuticals Inc.: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,954,511, Cl. 514-327.000.

Hoeflich, John C.; and Curry, David W., to Cooper Industries, Inc. Intrinsic safety module interface. 4,954,923, Cl. 361-111.000.

Hoelzle, Josef, to Siemens Aktiengesellschaft. Electronic pulse counter for simultaneous downward and upward counting. 4,955,041, Cl. 377-54.000.

Hoeptner, Herbert W., III, to Custom Chrome, Inc. Dual contact ignition system for motocycle internal combustion engine. 4,953,519, Cl. 123-622.000.

Hoesch AG: *See*—
Bahr, Diethelm, 4,953,993, Cl. 384-623.000.

Hoff, Heinz: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 4,953,354, Cl. 60-517.000.

Hofle, Gerhard: *See*—
Sutter, Marius; Bohlendorf, Bettina; Bedorf, Norbert; and Hofle, Gerhard, 4,954,517, Cl. 514-450.000.

Holbein, Erwin: *See*—
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Fluell, Adolf; and Maier, Hansueli, 4,953,802, Cl. 242-46.200.

Holbert, Gene W.: *See*—
Johnston, J. O'Neal; and Holbert, Gene W., 4,954,491, Cl. 514-174.000.

Holden, Richard S. Towel-protecting cover assembly. 4,953,603, Cl. 150-154.000.

Holdom, Kelvin S.: *See*—
Maeda, Hiroshi; Tone, Junsuke; Ruddock, John C.; and Holdom, Kelvin S., 4,954,482, Cl. 514-8.000.

Hollingsworth, Elmont E.; and Schlaeger, Gary W., to Minnesota Mining and Manufacturing Company. Sealed insulation displacement connector. 4,954,098, Cl. 439-404.000.

Hollingsworth, John D.; and Pinto, Akiva, to John D. Hollingsworth on Wheels, Inc. Metallic wire used with textile fiber processing elements, in particular, with cleaning rollers. 4,953,264, Cl. 19-114.000.

Holodnak, Richard S.: *See*—
Riley, Gilbert N.; Holodnak, Richard S.; Malin, Richard A.; and Muller, Arno, 4,953,996, Cl. 400-162.200.

Holophane Company, Inc.: *See*—
Hammond, Douglas S.; and Odle, Herbert A., 4,954,935, Cl. 362-245.000.

Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., to SmithKline Beecham Corporation. Aromatic steroid 5-α-reductase inhibitors. 4,954,646, Cl. 435-184.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, 4,953,677, Cl. 192-3.300.
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Honda, Tadayoshi: *See*—
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Honda, Tohru: *See*—
Tanemura, Fumikazu; Honda, Tohru; Ohta, Shigetoshi; Kajita, Yoshiharu; and Kachi, Tatsushi, 4,954,460, Cl. 501-80.000.

Honegger, Werner, to Ferag AG. Method of and apparatus for outfeeding printed products arriving in an imbricated formation. 4,953,847, Cl. 271-277.000.

Honeywell Inc.: *See*—
Sullivan, Charles T., 4,954,972, Cl. 364-526.000.

Hong, Myeon K. Severed adhesive tape supplying device. 4,953,430, Cl. 83-155.000.

Hoogeboom, Adrianus J. T.: *See*—
van der Weide, Jouke; and Hoogeboom, Adrianus J. T., 4,953,516, Cl. 123-527.000.

Hooper, Richard G., to NaTec Resources, Inc. Method of baghouse brown plume pollution control. 4,954,324, Cl. 423-239.000.

Hoover, Judith L. Three-dimensional maze pet toy. 4,953,502, Cl. 119-29.000.

Hooykaas, Carel W. J., to Pelt & Hooykaas B.V. Gas bearing part, and device provided with such a gas bearing part. 4,953,989, Cl. 384-12.000.

Hopkins, Thomas R.; and Banasiak, Dennis S., to Phillips Petroleum Company. Process utilizing alcohol oxidase. 4,954,354, Cl. 426-8.000.

Hopkins, William M.: *See*—
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmalix, Charles K., 4,953,604, Cl. 152-209.00A.

Horbach, Rainier: *See*—
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Horigome, Shinkichi: *See*—
Nishida, Tetsuya; Terao, Motoyasu; Miyauchi, Yasushi; and Horigome, Shinkichi, 4,954,379, Cl. 428-64.000.

Horlenko, Theodore: *See*—
Fritch, John R.; Fruchey, Olan S; and Horlenko, Theodore, 4,954,652, Cl. 564-223.000.

Horn, Michael: *See*—
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Hosaka, Takashi, to Seiko Instruments Inc. Semiconductor device with silicon oxynitride over refractory metal gate electrode in LDD structure. 4,954,867, Cl. 357-52.000.

Hosaka, Yoshifumi; Otsuka, Saburo; Kinoshita, Takashi; and Ito, Yusuke, to Nitto Electric Industrial Co., Ltd. Dermal pharmaceutical preparations. 4,954,343, Cl. 424-448.000.

Hoshida, Shigehiro: *See*—
Amano, Tadashi; and Hoshida, Shigehiro, 4,954,595, Cl. 526-344.200.

Hosiden Electronics Co. Ltd.: *See*—
Sekiguchi, Shigemi, 4,954,097, Cl. 439-352.000.

Hosokawa, Yoshikazu: *See*—
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takuya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, 4,954,855, Cl. 357-23.700.

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Howell, John S., IV; Widner, Kenneth P.; and Guenther, Gary D., 4,954,974, Cl. 364-551.010.

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Pollak, Alfred; and Maszkiewicz, Michael, 4,954,714, Cl. 250-458.100.

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Hsu, Hui-Pin; and Jang, Soon, to Hughes Aircraft Company. High strength optical fiber splice. 4,954,152, Cl. 65-3.100.

Hsu, Sheng H., to Nestec S.A. Apparatus for agglomeration. 4,954,060, Cl. 425-85.000.

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Lee, James; Beck, Richard; Lee, Chune; and Hu, Edward, 4,954,873, Cl. 357-72.000.

Hu, Long-Hai. Fully automatic phase controller for a non-coil armature type generator. 4,954,765, Cl. 323-217.000.

Huang, Johnny: *See*—
Huang, Tony; and Huang, Johnny, 4,953,696, Cl. 206-214.000.

Huang, Pao-Ter: *See*—
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, 4,953,300, Cl. 38-36.000.

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Jorgensen, Robert W.; Young, Vance W., Jr.; and Misenar, Scott L., 4,953,898, Cl. 285-340.000.
Jorgensen, Robert W.; and Schnell, Kenneth R., 4,954,667, Cl. 174-53.000.

Huc, Alain: *See—*
Gimeno, Rene ; Huc, Alain; and DeVictor, Pierre, 4,953,299, Cl. 34-92.000.

Hudson, Barry, to BP Chemicals Limited. Catalytic preparation of polycarbonate from dialkyl carbonate and bis phenol dicarboxylate. 4,954,613, Cl. 528-371.000.

Huggins, Richard: *See—*
Braunstein, Michael; and Huggins, Richard, 4,953,848, Cl. 272-8.500.

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Berwin, Ted W., 4,954,757, Cl. 315-403.000.
Chapman, William L.; Marner, Charles F.; Schotter, Daniel K.; and Hehn, Ronald L., 4,953,422, Cl. 74-526.000.
Fiden, William H., 4,954,829, Cl. 342-60.000.
Grant, Richard W.; and Storaasli, Allen G., 4,954,832, Cl. 342-352.000.
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Krikorian, Kapriel V.; Rosen, Robert A.; and Li, Frank K., 4,954,830, Cl. 342-137.000.
LeCompte, George W., 4,953,803, Cl. 242-47.000.
Mihich, Alexander, 4,953,932, Cl. 350-96.150.
Moulin, Norbert L., 4,953,944, Cl. 350-96.210.
Parker, Merle D., 4,953,925, Cl. 350-6.100.
Wreede, John E., 4,953,923, Cl. 350-3.610.

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Pessier, Rudolf C. O., 4,953,641, Cl. 175-353.000.

Hui, Henry K.: *See—*
Yafuso, Masao; Yan, Cheng F.; Hacker, Thomas G.; Hui, Henry K.; Maxwell, Thomas P.; and Miller, William W., 4,954,318, Cl. 422-59.000.

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Hull, Michael; and Scowen, Reginald V., to Lever Brothers Co. Detergent composition containing PVP and process of using same. 4,954,292, Cl. 252-542.000.

Humphrey, James C., to GTE Products Corporation. Sliding gimbal connector. 4,954,094, Cl. 439-247.000.

Hums, Erich, to Siemens Aktiengesellschaft. Method of making catalysts from titanium oxide. 4,954,476, Cl. 502-350.000.

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Hunkin, David J.: *See—*
Hill, Godfrey R.; Smith, David W.; and Hunkin, David J., 4,955,026, Cl. 372-18.000.

Hunt, Alan W.: *See—*
Page, Ronald C.; and Hunt, Alan W., 4,953,678, Cl. 192-67.00R.

Hunter, Gerald D.: *See—*
Pearman, Arthur N. J.; Hunter, Gerald D.; Gilman, Robert E.; Woessner, Michael A.; and Lyden, Daniel T., 4,953,386, Cl. 73-3.000.

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Hunter, Paul; and Schwee, Leonard J., to United States of America, Navy. Process of making thin film vector magnetometer. 4,954,216, Cl. 156-634.000.

Hurter, Rudolf, to Ciba-Geigy Corporation. Monoazo dyes containing sulfoindole coupling components. 4,954,563, Cl. 534-783.000.

Hurworth, Samuel G., to Delhur Industries, Inc. Adjustable, pivotable blade for bulldozers and the like. 4,953,625, Cl. 172-305.000.

Husher, Stephen, to Penny & Giles Controls Limited. Linear displacement transducers utilizing voltage component in phase with current that varies linearly with core displacement. 4,954,776, Cl. 324-20716.000.

Hussain, Syed. Pay phone system and apparatus. 4,955,052, Cl. 379-94.000.

Hutchins, Brenda Q. Adjustable and removable chandelier chain cover. 4,954,939, Cl. 362-406.000.

Hutchison, Alan J.: *See—*
Chen, Jen; and Hutchison, Alan J., 4,954,504, Cl. 514-265.000.

Huybrechts, Serge, to Union Carbide Chemicals and Plastics Company Inc. Cables with low MS HEC water-blocking material. 4,953,946, Cl. 350-96.230.

Hwang, Feng-Lin. Warning device for the inadequate tire air pressure. 4,954,806, Cl. 340-442.000.

Hwang, Wei: *See—*
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., 4,954,731, Cl. 307-482.000.
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Hyatt, Gilbert P. System and method for increasing memory performance. 4,954,951, Cl. 364-200.000.

Hynes, Charles M. Multi package containers. 4,953,342, Cl. 53-398.000.

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Lauks, Imants R.; and Zelin, Michael P., 4,954,087, Cl. 439-71.000.

Ibiden Co., Ltd.: *See—*
Miyazaki, Yasumitsu; Enomoto, Ryo; and Yamada, Masaya, 4,953,931, Cl. 350-96.120.
Miyazaki, Yasumitsu; Enomoto, Ryo; and Yamada, Masaya, 4,953,943, Cl. 350-96.120.

Ichihara, Katsutarou; Ozawa, Norio; and Yasudz, Nobuaki, to Kabushiki Kaisha Toshiba. Optical recording medium and method of manufacturing the same. 4,954,841, Cl. 346-135.100.

Ichimura, Takeshige: *See—*
Nishiura, Masaharu; Ichimura, Takeshige; and Kamiyama, Michinari, 4,954,181, Cl. 136-244.000.

Ichinose, Atsuki: *See—*
Nakamura, Yoshihiro; Takahashi, Kazuya; Ichinose, Atsuki; and Mino, Testuya, 4,954,906, Cl. 360-77.080.

ICL Industries Ltd.: *See—*
Lerman, Ori; and Rozen, Shlomo, 4,954,648, Cl. 558-425.000.

Idel, Karsten-Josef: *See—*
Weymans, Gunther; Berg, Klaus; Grigo, Ulrich; Idel, Karsten-Josef; and Bottenbruch, Ludwig, 4,954,569, Cl. 525-146.000.

Idemitsu Kosan Co., Ltd.: *See—*
Hachiya, Satoshi, 4,954,600, Cl. 528-89.000.

Idemura, Satoshi: *See—*
Ohtake, Toshikazu; Hayashi, Munekazu; Idemura, Satoshi; Ohi, Kazumi; and Kunitake, Yuji, 4,954,304, Cl. 264-137.000.

Ienaga, Hirofumi: *See—*
Maekawa, Junichi; Abe, Masanori; Ienaga, Hirofumi; and Hashimoto, Shigeaki, 4,953,910, Cl. 296-223.000.

Igarashi, Hisanaga: *See—*
Miyamoto, Tsutomu; Igarashi, Hisanaga; and Hidenori, Sugiyama, 4,954,530, Cl. 514-718.000.

Igata, Akitoshi: *See—*
Takuma, Keisuke; Ohyama, Tsukasa; Ghoda, Isamu; Mikoda, Tamio; Koshida, Hitoshi; and Igata, Akitoshi, 4,954,410, Cl. 430-109.000.

Iguchi, Kazuyoshi; Tashima, Masatoshi; Tazi, Ryoichi; Yoshino, Soichi; and Yagi, Motoo, to Mitsubishi Denki Kabushiki Kaisha. Three phase alternator with common neutral leads. 4,954,734, Cl. 310-71.000.

Ihara, Hirokazu: *See—*
Kaijima, Ryota; Ihara, Hirokazu; Nitta, Yoshihiko; and Kaji, Hiroyuki, 4,954,984, Cl. 364-900.000.

Iida, Katsumi, to Diesel Kiki Co., Ltd. Apparatus for controlling an automobile air-conditioner to control defrost bleed air. 4,953,630, Cl. 165-17.000.

Iida, Shigehira: *See—*
Hashizume, Junichiro; Takei, Tetsuya; Iida, Shigehira; Saitoh, Keishi; and Arai, Takayoshi, 4,953,498, Cl. 118-719.000.

Iijima, Kenzaburou; and Hayashi, Yoshinori, to Yamaha Corporation. Magnetic-resistor sensor and a magnetic encoder using such a sensor. 4,954,803, Cl. 338-32.00R.

Iimuro, Shigeru; Morimoto, Yoshio; and Kitamura, Takashi, to Mitsui Toatsu Chemicals, Inc. Process for preparing high-purity bisphenol A. 4,954,661, Cl. 568-727.000.

Ikai, Takashi: *See—*
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Suzuki, Koichi, 4,954,165, Cl. 71-103.000.

Ikai, Takasi: *See—*
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Ikari, Ichiro: *See—*
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Ikeda, Hiroshi: *See—*
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Ikeda, Minoru: *See—*
Takagi, Kiyoharu; Tanikawa, Naoya; and Ikeda, Minoru, 4,953,591, Cl. 137-568.000.

Ikeda, Naoya: *See—*
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.

Ikeda, Sadanobu, to NEC Corporation. Cache control circuit in cache memory unit with unit for enabling to reduce a read access time for cache memory. 4,954,944, Cl. 364-200.000.

Ikegame, Tetsuo: *See—*
Ishiwata, Hiroshi; Ikegame, Tetsuo; and Ikari, Ichiro, 4,953,959, Cl. 350-432.000.

Ikuta, Hironori: *See—*
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.

Ilco Unican Inc.: *See—*
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Illinois Tool Works, Inc.: *See—*
Ruehl, William E., 4,954,672, Cl. 200-51.090.

ILVA S.p.A.: *See—*
Foglio, Salvatore, 4,953,760, Cl. 222-600.000.

Imagawa, Kiyotaka, to Sakura Color Products Corporation. Erasable ink compositions. 4,954,174, Cl. 106-27.000.

Imai, Akihiro: *See—*
Taguchi, Nobuyoshi; Imai, Akihiro; Murata, Yukichi; and Hirota, Takao, 4,954,478, Cl. 503-227.000.
Imai, Yoshio: *See—*
Kumagai, Hiromi; Sato, Kaoru; and Imai, Yoshio, 4,954,685, Cl. 319-390.000.
Imaizumi, Tomio, to Tokico Ltd. Damping force adjustable hydraulic shock absorber. 4,953,671, Cl. 188-299.000.
Imanaka, Yoshihiko; Machi, Takato; Yamanaka, Kazunori; Yokoyama, Hiromitsu; Kamehara, Nobuo; and Niwa, Koichi, to Fujitsu Limited. Multi-layer superconducting circuit substrate and process for manufacturing same. 4,954,480, Cl. 505-1.000.
Imaseki, Takashi; and Kobari, Yuji, to Nissan Motor Co., Ltd. Vehicular differential limiting torque control system. 4,953,654, Cl. 180-197.000.
IMED Corporation: *See—*
Irvin, Ronald D.; Burkett, David; Kaplan, David E.; and Harvey, Ronald J., 4,954,046, Cl. 417-53.000.
Immunopath Profile, Inc.: *See—*
Girsh, Leonard S., 4,954,361, Cl. 426-580.000.
Imoto, Katsuyuki; Sano, Hirohisa; Miyazaki, Masaru; Matsuoka, Naoyuki; and Uetsuka, Hisato, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Waveguide type light merging and branching device. 4,953,934, Cl. 350-96.150.
Imperial Chemical Industries PLC: *See—*
Hartridge, Leonard S. G.; Taylor, David W.; and Waters, Roger L., 4,954,368, Cl. 427-256.000.
Schofield, John D., 4,954,177, Cl. 106-499.000.
Scott, Graham W.; Gough, Paul; Hendy, Brian N.; and Cinderey, Michael B., 4,954,143, Cl. 55-16.000.
Winterton, Neil; and Carey, John G., 4,954,287, Cl. 252-182.260.
Inaba, Michihiko: *See—*
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Inaba, Shizue: *See—*
Maeda, Shuichi; Kaneko, Toshio; Kurose, Yutaka; Kimura, Michiyo; Yoshida, Hidemi; Uchino, Kenichi; and Inaba, Shizue, 4,954,420, Cl. 430-270.000.
Inaba, Takihiro: *See—*
Takano, Shuntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, 4,954,518, Cl. 514-456.000.
Inai, Yuichi: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.
Inaji, Toshio: *See—*
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Inductotherm Corp.: *See—*
Fishman, Oleg; Prabhu, Satyen N.; Burk, John P.; and Tabatabaei, Emad, 4,953,761, Cl. 222-602.000.
Industrial Insulations of Texas, Inc.: *See—*
Price, Donald; Price, Frank; and Nelson, Charles M., 4,954,202, Cl. 156-353.000.
Infotron Systems Corporation: *See—*
Stone, William H.; and Boyer, William E., 4,955,020, Cl. 370-85.900.
Ing. C. Olivetti & C., S.p.A.: *See—*
Fogaroli, Giuseppe; Coli, Giuseppe; Tadini, Giorgio; and Meazza, Giampiero, 4,954,888, Cl. 358-75.000.
Ingersoll-Rand Company: *See—*
Hamner, Jeffrey W.; and Schivley, George P., Jr., 4,953,639, Cl. 175-203.000.
Ingleton, Robert A.: *See—*
Starr, Robert C.; and Ingleton, Robert A., 4,953,637, Cl. 175-20.000.
Inner Solar Roof System, Inc.: *See—*
Allegro, Joseph, 4,953,537, Cl. 126-432.000.
Inoda, Kenichi; and Harada, Terumaru, to Matsushita Electric Industrial Co., Ltd. Free-piston compressor with gas spring control. 4,954,053, Cl. 417-379.000.
Inoue, Atsushi, to Kabushiki Kaisha Toshiba. Processor-selection system. 4,954,945, Cl. 364-200.000.
Inoue, Masahiro; Tajima, Hatsuo; Sakemi, Yuji; and Okado, Kenji, to Canon Kabushiki Kaisha. Developing method and device and color image forming method and apparatus using same. 4,954,404, Cl. 430-45.000.
Inoue, Noriyuki; Kojima, Tetsuro; Heki, Tatsuo; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Process for the formation of direct positive images. 4,954,427, Cl. 430-409.000.
Inoue, Toshihiro; and Ozawa, Kazuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Wiring structure. 4,954,085, Cl. 439-34.000.
Inouye, Shigeharu: *See—*
Tsuroka, Takashi; Nakabayashi, Satoru; Matsuhashi, Yuji; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,954,510, Cl. 514-315.000.
Insetta, Victor D.; Monsorno, Richard V.; and Dorrian, John F., to American Technical Ceramics Corporation. Process for applying conductive terminations to ceramic components. 4,953,273, Cl. 29-25.420.
Insley, Thomas I.: *See—*
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., 4,953,544, Cl. 128-156.000.
Inspiration Markets, Inc.: *See—*
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Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG: *See—*
Klopfer, Walter; Haug, Fritz; Gabauer, Dale; and Workley, James, 4,954,777, Cl. 324-232.000.
Institute of Gas Technology: *See—*
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Integrated Genetics, Inc.: *See—*
Beck, Anton K.; Withy, Raymond M.; Zabrecky, James R.; and Masiello, Nicholas C., 4,954,437, Cl. 435-69.400.
Intermedics, Inc.: *See—*
Fischer, Elmar R., 4,954,105, Cl. 439-864.000.
International Business Machines: *See—*
Batista, Joseph F.; Ma, Wai M.; and Squires, John J., 4,953,929, Cl. 350-96.200.
International Business Machines Corporation: *See—*
Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, 4,954,142, Cl. 51-309.000.
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky C., 4,954,731, Cl. 307-482.000.
Dhong, Sang H.; Hwang, Wei; and Lu, Nicky Chau-Chun, 4,954,854, Cl. 357-23.400.
Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, 4,954,711, Cl. 250-423.00R.
Freeman, William A.; Pogorzelski, James S.; Solie, Darryl W.; and Wilson, Jacqueline H., 4,954,950, Cl. 364-200.000.
Gaudenzi, Gene J., 4,954,738, Cl. 307-454.000.
Gray, James P.; Knauth, Jeffrey G.; Pozefsky, Diane P.; and Rafslow, Lee M., 4,954,821, Cl. 340-825.520.
Jambotkar, Chakrapani G., 4,954,457, Cl. 437-31.000.
Johnson, John M.; Rocke, James A.; and Udupa, Divakara K. R., 4,954,965, Cl. 364-514.000.
Mahmoud, Issa S., 4,954,226, Cl. 204-15.000.
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Ree, Moonhor; Swanson, Sally A.; Volksen, Willi; and Yoon, Do Y., 4,954,578, Cl. 525-432.000.
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Lipman, Kenneth; and Young, Douglas G., 4,954,726, Cl. 307-46.000.
Inventio AG: *See—*
Rulke, Gerhart, 4,953,686, Cl. 198-332.000.
Ionescu, Adrian F. A.C. power controller with short circuit and overload protection. 4,955,069, Cl. 388-811.000.
Irvin, Ronald D.; Burkett, David; Kaplan, David E.; and Harvey, Ronald J., to IMED Corporation. Peristaltic pump with mechanism for maintaining linear flow. 4,954,046, Cl. 417-53.000.
Irwin Magnetic Systems, Inc.: *See—*
Bolt, Michael L., 4,954,921, Cl. 360-121.000.
Isenga, Steve, to ITC Incorporated. Transom light. 4,954,932, Cl. 362-61.000.
Ishida, Shuji: *See—*
Yoshioka, Hidetoshi; Kojima, Eiji; Ishida, Shuji; Yoshioka, Hiroyuki; and Murakami, Kunichika, 4,954,485, Cl. 514-49.000.
Ishigaki, Kunio; and Naoi, Takashi, to Fuji Photo Film Co., Ltd. Silver halide photographic element with polyester base. 4,954,430, Cl. 430-534.000.
Ishii, Kazunori; Terakado, Seishi; Funakoshi, Yasutomo; and Sakairi, Tadashi, to Matsushita Electric Industrial Co., Ltd. Self-regulating heating article having electrodes directly connected to a PTC layer. 4,954,696, Cl. 219-548.000.
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Kato, Eiichi; and Ishii, Kazuo, 4,954,407, Cl. 430-96.000.
Ishii, Shigetaka: *See—*
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Ishikawa, Hideaki: *See—*
Sasaki, Masahiro; Abe, Osamu; and Ishikawa, Hideaki, 4,953,513, Cl. 123-489.000.
Ishikawa, Kanzo; Hayashi, Ryutaro; and Yoshimoto, Akira, to Kawata Co., Ltd. Drying and crystallizing apparatus for granules, which employs a microwave device. 4,954,681, Cl. 219-10.55A.
Ishikawa, Shuichi; and Kuwano, Hiromichi, to Texas Instruments Incorporated. Power supply circuit and semiconductor integrated circuit device using it. 4,954,766, Cl. 323-272.000.
Ishikawa, Shunichi: *See—*
Nakamura, Taku; Hirano, Tsumoru; Funatsu, Eiji; and Ishikawa, Shunichi, 4,954,417, Cl. 430-138.000.
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Ishikawa Tekko Kabushiki Kaisha: *See—*
Suzuki, Kazumasa; Yamada, Masahiro; and Suzuki, Keiichiro, 4,954,006, Cl. 403-135.000.
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Isobe, Tadashi: *See—*
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Isozumi, Shuzoo, to Mitsubishi Denki Kabushiki Kaisha. Coaxial starter. 4,954,733, Cl. 310-71.000.
Israelsohn, Cedric; and Read, Andrew J. Water heating apparatus. 4,953,536, Cl. 126-374.000.
Itagaki, Akinari: *See*—
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Italiano, Pietro, to GRIV S.r.l. Methane catalytic combustion boiler for obtaining hot water for house-hold and industrial uses. 4,953,512, Cl. 122-4.00D.
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Isenga, Steve, 4,954,932, Cl. 362-61.000.
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Kawagoe, Kenji; Ito, Hideo; and Yokote, Masatsugu, 4,954,957, Cl. 364-424.050.
Ito, Hiroshi; Handa, Junichi; Takagi, Yoshio; and Minohara, Taketoshi, to Toyota Jidosha Kabushiki Kaisha. Pigment. 4,954,175, Cl. 106-417.000.
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Ito, Katsumi: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,954,625, Cl. 540-500.000.
Ito, Michiaki, to Kabushiki Kaisha Toshiba. Washing machine. 4,953,369, Cl. 68-23.700.
Ito, Norifumi: *See*—
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Ito, Shoji: *See*—
Osumi, Toru; Ito, Shoji; and Hashimoto, Kenji, 4,953,825, Cl. 251-129.170.
Ito, Toshikazu; Harada, Takashi; and Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Ceramic heat exchangers and production thereof. 4,953,627, Cl. 165-8.000.
Ito, Wataru: *See*—
Hasegawa, Kazumi; Ikeda, Hiroshi; and Ito, Wataru, 4,953,997, Cl. 400-616.300.
Ito, Yusuke: *See*—
Hosaka, Yoshifumi; Otsuka, Saburo; Kinoshita, Takashi; and Ito, Yusuke, 4,954,343, Cl. 424-448.000.
Itoh, Masahiko: *See*—
Nagai, Takeshi; Fukuda, Hiroshi; Itoh, Masahiko; and Shitaya, Takao, 4,954,694, Cl. 219-413.000.
Itsumi, Tadashi: *See*—
Iwamura, Soichi; Murakami, Satoshi; and Itsumi, Tadashi, 4,955,048, Cl. 379-53.000.
ITT Corporation: *See*—
Nieman, Gerald R.; Clyatt, Clarence L., III; Paulus, Eric J.; Zehrung, Scott A.; Ragl, Albert; and Moore, John R., 4,954,794, Cl. 333-182.000.
Iwaki, Yoshihisa: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, 4,953,677, Cl. 192-3.300.
Iwamoto, Mune; Ito, Norifumi; Sugazaki: Kazuo; Matsubara, Tetsuyuki; and Ando, Toshihiko, to Mitsui Toatsu Chemicals, Incorporated. Rubber dispersed copolymer resin. 4,954,571, Cl. 525-205.000.
Iwamoto, Norihiro, to Toshiba Kikai Kabushiki Kaisha. Injection pressure control apparatus for a die cast machine and an injection mold machine. 4,954,063, Cl. 425-149.000.
Iwamura, Soichi; Murakami, Satoshi; and Itsumi, Tadashi, to Sharp Kabushiki Kaisha. Multiplex transmission of audio signal and video signal through inhouse cable. 4,955,048, Cl. 379-53.000.
Iwanami, Teruo; Miyata, Shigeo; and Moriyama, Takamasa, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha; and Kyowa Kogyo Kabushiki Kaisha. Process for preparing molded article. 4,954,557, Cl. 524-399.000.
Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Method for forming intensified color image. 4,954,425, Cl. 430-373.000.
Iwasaki, Yasuji: *See*—
Oka, Masahiko; Uemoto, Hiroshi; and Iwasaki, Yasuji, 4,954,588, Cl. 526-247.000.
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Iwase, Akira; and Suzuki, Akira, to Toshiba Machine Company, Ltd. High-accuracy traveling table apparatus. 4,953,965, Cl. 350-632.000.
Iwata, Koji; Okuma, Shigeru; Kimura, Yoshimasa; Konata, Yoshihiro; and Kaneko, Kiyoshi, to Canon Kabushiki Kaisha. Driving device having a vibrator. 4,953,413, Cl. 74-1.0SS.
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Iwata, Noriko: *See*—
Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, 4,954,586, Cl. 526-245.000.
Iwata, Yasuhiro; and Uchigasaki, Yuzi, to Kabushiki Kaisha Toshiba. Paper supply device with a function of automatically sensing the life of feed rollers. 4,953,844, Cl. 271-9.000.
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Fey, Maurice G.; Iyer, Natraj C.; Male, Alan T.; and Lovic, William R., 4,954,170, Cl. 75-229.000.
Izukawa, Kazuhiro, to Canon Kabushiki Kaisha. Vibratory-wave motor device. 4,954,742, Cl. 310-316.000.
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Furutsu, Etsuro; and Izukawa, Kazuhiro, 4,954,741, Cl. 310-316.000.
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Izuoka, Yuki: *See*—
Suzuki, Takahiro; Izuoka, Yuki; and Aoki, Noboru, 4,954,743, Cl. 313-120.000.
J. M. Huber Corporation: *See*—
Wason, Satish K., 4,954,468, Cl. 502-63.000.
Jabs, Alfred, to MTU Motoren- und Turbinen-Union Munchen GmbH. Method of connecting heat exchange tubes to a fluid conveying duct. 4,953,290, Cl. 29-890.043.
Jackman, Dennis E.; and Morgan, John G., to Mobay Corporation. Process for desulfurization of isothioureas and isothioamides. 4,954,627, Cl. 544-182.000.
Jackson, Anthony M.: *See*—
August, Alfred A., Sr.; and Jackson, Anthony M., 4,954,813, Cl. 340-571.000.
Jackson, Ernest E. Filtered positive ventilation system for vehicle. 4,953,449, Cl. 98-2.110.
Jackson, Richard L.: *See*—
Mao, Simon J. T.; and Jackson, Richard L., 4,954,528, Cl. 514-712.000.
Jacob, Allan S.; and Zawadzki, Andrzej, to Heath Consultants Incorporated. Microprocesaor based tank test management system. 4,954,973, Cl. 364-551.010.
Jacob, Ingolf: *See*—
Wellenhofer, Herbert; Jacob, Ingolf; and Geirhos, Josef, 4,953,271, Cl. 28-272.000.
Jacobson, Michael R. Method of and means for playing a sports game of chance. 4,953,873, Cl. 273-274.000.
Jacquet, Jean-Pierre: *See*—
Weber, Abraham; Bouzard, Daniel; Esaiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,954,507, Cl. 514-300.000.
Jager, Andreas, to Arnold Jager. Revolving, inextensible band, particularly a track for vehicles. 4,953,920, Cl. 305-35.0EB.
Jaguar Cars Limited: *See*—
Parsons, Bryan N. V., 4,954,735, Cl. 310-82.000.
Jain, Faquir C., to University of Connecticut. Metal insulator semiconductor heterostructure lasers. 4,955,031, Cl. 372-45.000.
Jambotkar, Chakrapani G., to International Business Machines Corporation. Method of making heterojunction bipolar transistors. 4,954,457, Cl. 437-31.000.
Jamet, Bernard, to Saint-Gobain Vitrage. Method and device for the manufacture of a sheet of polyvinylbutyral. 4,954,306, Cl. 264-210.200.
Janchipraponvej, Ben, to Helene Curtis, Inc. Clear conditioning composition and method to impart improved properties to the hair. 4,954,335, Cl. 424-070.000.
Jang, Soon: *See*—
Hsu, Hui-Pin; and Jang, Soon, 4,954,152, Cl. 65-3.100.
Jannson, Magnus, Administrator: *See*—
Fransson, Rolf G.; Jansson, Bertil E., deceased; and Jannson, Magnus, Administrator, 4,954,092, Cl. 439-152.000.
Janse, Cornelis P.: *See*—
Driessen, Leonardus M. H. E.; and Janse, Cornelis P., 4,954,986, Cl. 365-189.010.
Jansson, Bertil E., deceased: *See*—
Fransson, Rolf G.; Jansson, Bertil E., deceased; and Jannson, Magnus, Administrator, 4,954,092, Cl. 439-152.000.
Jansson, Per-Olof: *See*—
Raitmaa, Raimo; and Jansson, Per-Olof, 4,953,304, Cl. 33-355.00R.
Janzen, Wolfgang, to Flexon Holland, B.V. Conveyor chain and attachments therefor. 4,953,691, Cl. 198-803.010.
Jao, Tze C.; Morton, Nancy A.; and Erickson, Robert W., Jr., to Motorola, Inc. Process for preparing overbased calcium sulfonates. 4,954,272, Cl. 252-25.000.
Japan Atomic Energy Research Institute: *See*—
Okamura, Kiyohito; Sato, Mitsuhiko; Hasegawa, Yoshio; Seguchi, Tadao; and Kawanishi, Shunichi, 4,954,461, Cl. 501-95.000.
Japan Synthetic Rubber Company, Ltd.: *See*—
Ono, Hisao; Sato, Ryuji; and Miyachi, Takumi, 4,954,125, Cl. 526-138.000.
Jard, James E. Tire pressure indicator. 4,953,395, Cl. 73-146.800.
Jarvik, Murray E.: *See*—
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D., 4,953,572, Cl. 131-270.000.
Jasser, Manfred; and Lipinski, Thomas, to Metec, Inc. Roof fall separating and removing apparatus and method for use in thin seam highwall mining. 4,953,915, Cl. 299-18.000.
Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., to SmithKline & French Laboratories Limited. Novel polystyrene anion exchange polymers. 4,954,339, Cl. 424-78.000.

Jean Walterscheid GmbH: *See*—
Coenen, Karl; Flanhardt, Michael; and Langen, Hans-Jurgen, 4,953,411, Cl. 73-862.330.
Jedlicka, Josef E.; LeBlanc, Ewart O.; and Masseth, Judith A., to Xerox Corporation. Process for assembling smaller arrays together to form a longer array. 4,954,197, Cl. 156-273.700.
Jeffs, David H.: *See*—
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Jenkins, Allan D.: *See*—
Dahlquist, E. Arthur; Jenkins, Allan D.; Truehart, David C.; and Baxter, Richard B., 4,954,041, Cl. 414-718.000.
Jenkins, Overton S. Portable hot ash vacuum. 4,953,255, Cl. 15-327.020.
Jensen, Lonald H., to Scott Jensen Industries, Inc. Method and apparatus for ozone generation. 4,954,321, Cl. 422-186.190.
Jensen, Michael L.; Nolf, Jean-Marie E.; Vansant, Jan; and Mendes, Luiz N., to Raychem Corporation. Cable splice case. 4,954,670, Cl. 174-92.000.
Jensen, Ned L., to William Seroy Group, The. Synthetic GTF chromium material for decreasing blood lipid levels and process therefor. 4,954,492, Cl. 514-188.000.
Jensen, Thomas H., to PPG Industries, Inc. Metering apparatus and method for the measurement of a fixed length of continuous strand. 4,954,720, Cl. 250-561.000.
Jensen, William T.; Brown, Vincent B.; Edgerton, Cathy J.; and Masterson, Robert W., to Methode Electronics, Inc. Terminator assembly for interconnecting computer devices. 4,954,089, Cl. 439-76.000.
Jernigan, Thomas K.: *See*—
Brower, David; and Jernigan, Thomas K., 4,953,483, Cl. 112-119.000.
Brower, David; and Jernigan, Thomas K., 4,953,485, Cl. 112-262.300.
Jessop, Paul M.; and Jeffs, David H., to Multi-Technology Inc. Medical fail safe releasible locks and/or seals for capped disposable centrifuge containers, cryogenic vials and the like. 4,953,741, Cl. 220-273.000.
Jewell, Raymond S., Jr.; and Hill, William E., to Tennessee Gas Pipeline Company. Muffler with two part housing and flow tubes. 4,953,660, Cl. 181-282.000.
Jewell, Ricky S. Deck bracket for of attaching a deck to a building. 4,953,339, Cl. 52-729.000.
Jim Walter Resources, Inc.: *See*—
Gauna, Michael, 4,954,018, Cl. 405-259.000.
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Yoshimoto, Akihiro; Jodo, Osamu; Watanabe, Yoshio; Okamoto, Rokuro; and Takeuchi, Tomio, 4,954,438, Cl. 435-78.000.
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Johal, Sarjit S.; and Cash, Howard A., to Standard Oil Company, The. Production of polysaccharides from filamentous fungi. 4,954,440, Cl. 435-101.000.
Johansson, Johan G. I.: *See*—
Reinhall, Rolf B.; Johansson, Johan G. I.; and Mokvist, Anders V., 4,954,221, Cl. 162-261.000.
John D. Hollingsworth on Wheels, Inc.: *See*—
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Johns Hopkins University: *See*—
Zerhouni, Elias; and Parish, David M., 4,953,554, Cl. 128-653.00A.
Johnson, Alan W., to Sauer-Sundstrand Company. Housing support for hydraulic displacement unit swashplate. 4,953,426, Cl. 74-606.00R.
Johnson, Christy L.; Schwank, Johannes; and Wise, Kensall D., to University of Michigan, The Regents of the. Ultrathin-film gas detector. 4,953,387, Cl. 73-25.030.
Johnson, Donald S.: *See*—
Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,953,778, Cl. 228-173.600.
Johnson, Gerald, to Otis Elevator Company. Step chain for curved escalator. 4,953,685, Cl. 198-328.000.
Johnson, John M.; Rocke, James A.; and Udupa, Divakara K. R., to International Business Machines Corporation. Enhanced frame utilization for CSMA/CD communication protocol. 4,954,965, Cl. 364-514.000.
Johnson, Larry K.: *See*—
Fry, Slaton E.; Magouyrk, David W.; Blankenship, Allen J.; Greene, Paul J.; and Johnson, Larry K., 4,954,573, Cl. 525-327.600.
Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Passivation of metal contaminated cracking catalysts using aqueous suspensions of antimony oxide. 4,954,467, Cl. 502-26.000.
Johnson, Robert N.; and Colon, Ismael, to Union Carbide Chemicals and Plastics Company Inc. Modified waterborne phenoxy resins. 4,954,553, Cl. 524-376.000.
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Johnston, J. O'Neal, to Merrell Dow Pharmaceuticals Inc. Method of treating hyperaldosteronism using 17β-cyclopropylaminoandrostene derivatives. 4,954,488, Cl. 514-177.000.
Johnston, J. O'Neal; and Holbert, Gene W., to Merrell Dow Pharmaceuticals Inc. Method of treatment using 18-cyanoprogesterone derivatives. 4,954,491, Cl. 514-174.000.
Johnston, William T.; Smith, Leslie, Jr.; and Barker, David K., to Trailstar Mfg. Corp. Uniframe rolloff dumpster. 4,954,039, Cl. 414-500.000.
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Jokisch, Friedrich; Linke, Adolf; and Pohl, Hans-Christoph, to Krupp Koppers GmbH. Method of cooling hot product gas with adhesive or fusible particles. 4,954,136, Cl. 48-197.00R.
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Jones, John E.: *See*—
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Jones, Mark A., to Courtaulds Films & Packaging (Holdings) Ltd. Polymeric films. 4,954,393, Cl. 428-288.000.
Jones, Paul A.: *See*—
Wexler, Stuart K.; Jones, John E.; and Jones, Paul A., 4,953,326, Cl. 52-33.000.
Jones, Richard L., to Conoco Inc. Fibrous substrates containing hot melt coatings made from a novel petroleum wax. 4,954,373, Cl. 427-389.900.
Joos, Bob. Spacers for laying tile and method of use. 4,953,341, Cl. 52-747.000.
Jorgensen, Robert W.; Young, Vance W., Jr.; and Misenar, Scott L., to Hubbell Incorporated. Mechanical fastener for plastic conduits. 4,953,898, Cl. 285-340.000.
Jorgensen, Robert W.; and Schnell, Kenneth R., to Hubbell Incorporated. Electrical box with coupling members. 4,954,667, Cl. 174-53.000.
Jorgenson, Michael W.: *See*—
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Jos, Doucet; and Neves, Mendes L., to Raychem Corporation. Wraparound recoverable sleeve. 4,954,213, Cl. 156-49.000.
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Jung, Hans. Device for moving patients who are confined to bed. 4,953,245, Cl. 5-81.00B.
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Juridical Foundation The Chemo-Sero-Therapeutic Research Institute: *See*—
Maeda, Haruhisa; Tsujikawa, Akira; and Susumi, Sadao, 4,954,340, Cl. 424-92.000.
Just, Guenther; and Wuest, Willi. Process for removing cellulose ethers from a cellulose ether suspension. 4,954,268, Cl. 210-772.000.
Juy, Henri, to Simplex, S.A. Rear derailleur for bicycles or similar vehicles. 4,954,121, Cl. 474-82.000.
K-Tron International, Inc.: *See*—
Kalata, Paul R., 4,954,975, Cl. 364-567.000.
Kabushiki Kaisha ALPS TOOL: *See*—
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Izume, Takatomo, 4,954,686, Cl. 219-110.000.
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Koike, Norio, 4,954,418, Cl. 430-175.000.
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Okumura, Katsuya; Watanabe, Tohru; and Watase, Masami, 4,954,218, Cl. 156-643.000.
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Kaijima, Ryota; Ihara, Hirokazu; Nitta, Yoshihiko; and Kaji, Hiroyuki, to Hitachi, Ltd. Method and apparatus for supplementing translation information in machine translation. 4,954,984, Cl. 364-900.000.

Kain, William S.: *See*—
Staker, Doanld D.; and Kain, William S., 4,954,363, Cl. 426-636.000.

Kaiser, Howard; and Kaiser, Laurie A. C. Protective disposable sheath for muscle monitor. 4,953,563, Cl. 128-778.000.

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Kajita, Koji, to Canon Kabushiki Kaisha. Image reading apparatus. 4,954,913, Cl. 358-474.000.

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Kamata, Yoshikiyo: *See*—
Hironaka, Yoshiaki; Matsubayashi, Tatsuhiko; Kamata, Yoshikiyo; and Tasaki, Takanobu, 4,953,526, Cl. 123-182.000.

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Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.

Kamegamori, Masayuki: *See*—
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Kobushi, Kazuhiro; Kameyama, Shuichi; and Komeda, Tadao, 4,954,454, Cl. 437-21.000.

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Nishiura, Masaharu; Ichimura, Takeshige; and Kamiyama, Michinari, 4,954,181, Cl. 136-244.000.

Kanade, Pradeep G.: *See*—
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Kando, Yasuyuki: *See*—
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Kane, James: *See*—
Tuenge, Richard T.; and Kane, James, 4,954,747, Cl. 313-506.000.

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Saeki, Junichi; Kaneda, Aizo; and Nishi, Kunihiko, 4,954,301, Cl. 264-40.100.

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Uekita, Masakazu; and Awaji, Hiroshi, 4,954,608, Cl. 528-350.000.

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Kira, Kazuaki, 4,954,127, Cl. 600-36.000.

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Yabe, Isao; Komatsu, Katsuji; and Kaneko, Hiroyuki, 4,954,308, Cl. 264-272.170.

Kaneko, Kiyoshi: *See*—
Iwata, Koji; Okuma, Shigeru; Kimura, Yoshimasa; Konata, Yoshihiro; and Kaneko, Kiyoshi, 4,953,413, Cl. 74-1.0SS.

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Kanno, Yohichi: *See*—
Ohmi, Tadahiro; Kanno, Yohichi; Satoh, Kazuhiko; and Hatayama, Tadahiro, 4,953,826, Cl. 251-331.000.

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Kubota, Shigeru; Kanou, Shoji; and Kubo, Masahiro, 4,953,749, Cl. 221-168.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Shuku, Shigekazu; Mukoyoshi, Shunichiro; Yuasa, Eiji; and Yamori, Tsunefumi, 4,954,477, Cl. 503-226.000.

Kanzaki Seishi Co., Ltd.: *See*—
Matsumoto, Mitsuo, 4,954,203, Cl. 156-361.000.

Kaplan, David E.: *See*—
Irvin, Ronald D.; Burkett, David; Kaplan, David E.; and Harvey, Ronald J., 4,954,046, Cl. 417-53.000.

Kapoor, Mohan L.: *See*—
Young, Edward L.; and Kapoor, Mohan L., 4,954,752, Cl. 315-169.300.

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Karlsson, Markku: *See*—
Eskelinen, Pekka; Raatikainen, Pentti; Karlsson, Markku; and Virta, Raimo, 4,953,297, Cl. 34-23.000.

Karol, Mark J.: *See*—
Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., 4,955,016, Cl. 370-60.000.
Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., 4,955,017, Cl. 370-60.000.

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Ito, Hiroshi; Kasezawa, Tadashi; and Yao, Masaharu, 4,954,885, Cl. 358-31.000.

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Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.

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Masaoka, Kazuhiko; and Kasori, Yukio, 4,954,621, Cl. 536-119.000.

Kasper, John M.; Perley, Maurice K., Jr.; and Gullett, Bradley T. Multi-attractant fish bait. 4,953,319, Cl. 43-42.060.

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Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, 4,955,082, Cl. 455-33.000.

Katada, Tsuyoshi: *See*—
Saotome, Yoshimi; Kuchiki, Kiyotsuna; and Katada, Tsuyoshi, 4,953,723, Cl. 212-159.000.

Kato, Chihiro: *See*—
Endo, Keiichi; Shinbo, Yasushi; Kageyama, Akira; Katsuya, Yasuo; Kato, Chihiro; Fukasawa, Masato; and Sekine, Makoto, 4,954,406, Cl. 430-60.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic photoreceptor comprising binder resin containing acidic groups. 4,954,407, Cl. 430-96.000.

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Kato, Hitoshi: *See*—
Takahashi, Takehiko; and Kato, Hitoshi, 4,953,887, Cl. 280-647.000.

Kato, Kanami, to Signode Corporation. Method of gripping a strap for bonding the strap end portions to each other. 4,953,599, Cl. 140-93.400.

Kato, Masaru: *See*—
Kawai, Yoshikazu; Sato, Chosuke; and Kato, Masaru, 4,953,649, Cl. 180-79.100.

Kato, Toshikazu: *See*—
Mohri, Akira; and Kato, Toshikazu, 4,953,699, Cl. 206-330.000.

Katsukawa, Tadashi: *See*—
Endo, Kunio; and Katsukawa, Tadashi, 4,954,889, Cl. 358-80.000.

Katsuki, Kazuo; Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, to Nippon Sheet Glass Co., Ltd. Image recognition apparatus. 4,955,060, Cl. 382-32.000.

Katsuma, Toshiaki; and Hirano, Nagayoshi, to Fuji Photo Optical Co., Ltd. Variable magnification duplicator lens system. 4,953,958, Cl. 350-425.000.

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Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, 4,954,142, Cl. 51-309.000.

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Walker, James T.; and Kausch, Marvin L., 4,954,970, Cl. 364-521.000.

Kautz, Thomas O., to Johnson Service Company. Dual mode pneumatic control system. 4,953,578, Cl. 137-14.000.

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Kawada, Yukihiro: *See*—
Nakayama, Yoshiaki; Saito, Kenji; and Kawada, Yukihiro, 4,954,884, Cl. 358-29.000.

Kawagoe, Kenji; Ito, Hideo; and Yokote, Masatsugu, to Nissan Motor Company, Limited. Control system for adapting suspension characteristics and steering characteristics to vehicle driving condition. 4,954,957, Cl. 364-424.050.

Kawaguchi, Shiro; and Kai, Katsumori, to Eidai Industry Co., Ltd. Decorative board having hot-melt resin joints. 4,953,335, Cl. 52-384.000.

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Yamada, Masahiro; and Kawai, Kiyoyuki, 4,954,824, Cl. 341-61.000.

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Kurogama, Tatsuji; Kawai, Masanori; Matsushima, Koji; and Watanabe, Mitsuru, 4,954,702, Cl. 250-201.200.

Kawai, Masao: *See*—
Moroto, Shuzo; Kawai, Masao; Yokoyama, Shoji; Kobayashi, Koji; and Sumiya, Koji, 4,954,959, Cl. 364-449.000.

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Nagaoka, Shinji; Kawai, Michio; and Sato, Koji, 4,954,861, Cl. 354-403.000.

Kawai, Yoshikazu; Sato, Chosuke; and Kato, Masaru, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Four-wheel steering device for an automobile. 4,953,649, Cl. 180-79.100.

Kawakami, Osamu: *See*—
Kawasaki, Takuya; and Kawakami, Osamu, 4,953,368, Cl. 18-5.00C.

Kawamoto, Tetsuo; Motohashi, Ryo; Sakamoto, Toshihiro; Suzuki, Yasuo; and Abe, Hideaki, to Matsushita Electric Works, Ltd. Permanent magnet rotor with magnets secured by synthetic resin. 4,954,736, Cl. 316-156.000.

Kawamura, Fumio: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.

Kawamura, Kazuhiko; and Sato, Kazuo, to Sumitomo Rubber Industries, Ltd. Reinforcing structure for bead portion of radial tire for heavy load. 4,953,605, Cl. 152-541.000.

Kawanishi, Shunichi: *See*—
Okamura, Kiyohito; Sato, Mitsuhiko; Hasegawa, Yoshio; Seguchi, Tadao; and Kawanishi, Shunichi, 4,954,461, Cl. 501-95.000.

Kawano, Kazuhiko: *See*—
Miyazawa, Takeshige; and Kawano, Kazuhiko, 4,954,157, Cl. 71-86.000.

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Kawasaki, Ikuya: *See*—
Masuda, Satoshi; Kawasaki, Ikuya; and Matsui, Shigezumi, 4,954,942, Cl. 364-200.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishiyama, Yukio; Fujioka, Junzo; Hino, Haruki; Matsuzaki, Yuji; Sakiyama, Masayuki; and Yokoyama, Minoru, 4,954,314, Cl. 419-45.000.

Kawasaki Steel Corp.: *See*—
Takajo, Shigeaki; Furukimi, Osamu; Ogura, Kuniaki; Maruta, Keiichi; Abe, Teruyoshi; and Sakurada, Ichio, 4,954,171, Cl. 75-246.000.

Kawasaki, Takuya; and Kawakami, Osamu, to Nikku Industry Co., Ltd. Method of and apparatus for heat-treating bobbins of yarn. 4,953,368, Cl. 18-5.00C.

Kawase, Masaki: *See*—
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Kawashima, Norimichi; and Orii, Kazuya, to Tokyo Magnetic Printing Co., Ltd. Abrasives, abrasive tools, and grinding method. 4,954,140, Cl. 51-295.000.

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Kawabata, Masaaki; and Kawashima, Tokio, 4,954,936, Cl. 362-249.000.

Kawata Co., Ltd.: *See*—
Ishikawa, Kanzo; Hayashi, Ryutaro; and Yoshimoto, Akira, 4,954,681, Cl. 219-10.55A.

Kaye, Michael C., to Encore Video, Inc. Method and apparatus for correcting video color signals. 4,954,881, Cl. 358-22.000.

Keefer, Larry K., to United States of America, Health and Human Services. Stabilized nitric oxide - primary amine complexes useful as cardiovascular agents. 4,954,526, Cl. 514-611.000.

Keith, Harold D.: *See*—
Davis, Robert L.; and Keith, Harold D., 4,954,017, Cl. 405-259.000.

Keller, Leonard J.; and Stanton, Austin N. Methacoal integrated combined cycle power plants. 4,953,479, Cl. 110-233.000.

Kelley, Charles D.: *See*—
Sarrine, Robert J.; Garsee, Henry A.; Kelley, Charles D.; and Guadagno, Philip A., 4,954,237, Cl. 204-299.00R.

Kelley, Rusty L.: *See*—
Annin, David R.; and Kelley, Rusty L., 4,953,609, Cl. 160-24.000.

Kellison, Roger C. Road barrier systems and methods. 4,954,009, Cl. 404-6.000.

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Kelly, Martha J., to Rohm and Haas Company. Preparation of alkylhydrazines. 4,954,655, Cl. 564-464.000.

Kelm, James S.: *See*—
Corsmeier, Robert J.; and Kelm, James S., 4,953,282, Cl. 29-451.000.

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Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderhold, James L., Jr., 4,954,241, Cl. 208-59.000.

Kennedy, Lawrence C., to Detroit Diesel Corporation. Combined pressure regulator and relief valve having a single biasing means. 4,953,582, Cl. 137-115.000.

Kensrue, Milo M. Modular welding gun. 4,954,690, Cl. 219-137.310.

Kern, Manfred: *See*—
Koch, Volker; Schnatterer, Stefan; Bonin, Werner; Kern, Manfred; Knauf, Werner; and Waltersdorfer, Anna, 4,954,529, Cl. 514-594.000.

Kervagoret, Gilbert; and Tanguy, Christian, to Bendix France. Control device with failure detection centering for a double-acting hydraulic jack. 4,953,445, Cl. 91-358.00A.

Kesku, Tadeusz, to Hasbro, Inc. Track assembly for toy vehicle. 4,953,785, Cl. 238-10.00A.

Kessler, Hans, to Leybold Aktiengesellschaft. Apparatus for coating continuous webs. 4,953,497, Cl. 118-718.000.

Keystone International Holdings Corp.: *See*—
Kusmer, Daniel P.; and Yohner, Paul A., 4,953,276, Cl. 29-235.000.

Khuddus, Mohammed A.: *See*—
Schleifstein, Robert A.; and Khuddus, Mohammed A., 4,954,551, Cl. 524-327.000.

Kidder, Stephen E.; and Spector, George. Purse light. 4,954,934, Cl. 362-156.000.

Kiefer, Dieter; and Grommes, Helmut, to Deutsche Babcock Werke Aktiengesellschaft. Bowl-and-roller mill. 4,953,793, Cl. 241-119.000.

Kieli, Michael: *See*—
Lanzetta, Carmen, Jr.; Kieli, Michael; Schindler, Guenter; and Williams, Russell H., 4,953,940, Cl. 350-96.200.

Kiene, Wilfried: *See*—
Appel, Eggert; Kiene, Wilfried; Kuchemann, Rudi; Meier, Dieter; and Nissen, Peter, 4,953,408, Cl. 73-861.160.

Kierum, Chandler T.; and Dupree, Leonard J. Animal scent dispensing apparatus. 4,953,763, Cl. 222-644.000.

Kihm, Theodore E.: *See*—
Dehner, Charles V., Jr.; and Kihm, Theodore E., 4,954,981, Cl. 364-900.000.

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Kikuchi, Kimihiko: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, 4,953,677, Cl. 192-3.300.

Kikuchi, Sei: *See*—
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Kilby, Frank: *See*—
Sharber, Jerry; and Kilby, Frank, 4,953,822, Cl. 248-281.100.

Killion, Robert F.; and Wolfe, Michael J., to Tomco Incorporated. Exhaust gas recirculation valve. 4,953,518, Cl. 123-568.000.

Kim, Byung-Hong; Kim, Tae-Sung; and Kim, Hae-Yeong, to Korea Advanced Institute of Science and Technology. Bioelectrochemical desulfurization of petroleum. 4,954,229, Cl. 204-130.000.

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Kim, Hongkyu: *See*—
Collins, George L.; Kim, Hongkyu; and Pleban, William M., 4,954,400, Cl. 428-414.000.

Kim, Jong S.; Lee, Ki T.; and Shu, Dong B., to Korea Steel Chemical Co., Ltd. Process for drying carboxyl containing polymers of vinylidene monomers. 4,954,615, Cl. 528-501.000.

Kim, Jung-Soo, to SamSung Electronic Co., Ltd. Circuit and method for power efficiency improvement of induction motors. 4,954,764, Cl. 318-798.000.

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Kim, Byung-Hong; Kim, Tae-Sung; and Kim, Hae-Yeong, 4,954,229, Cl. 204-130.000.

Kim, Yeo H.: *See*—
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Lee, Chang H.; and Kim, Young J., 4,953,236, Cl. 4-194.000.

Kimura, Fumikazu, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Radiator device of motorcycle. 4,953,631, Cl. 165-41.000.

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Maeda, Shuichi; Kaneko, Toshio; Kurose, Yutaka; Kimura, Michiyo; Yoshida, Hidemi; Uchino, Kenichi; and Inaba, Shizue, 4,954,420, Cl. 430-270.000.

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Mizutani, Yoshihisa; and Kimura, Minoru, 4,954,871, Cl. 357-67.000.

Kimura, Takeshi: *See*—
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; Ogawa, Taro; and Kimura, Takeshi, 4,954,424, Cl. 430-323.000.

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Iwata, Koji; Okuma, Shigeru; Kimura, Yoshimasa; Konata, Yoshihiro; and Kaneko, Kiyoshi, 4,953,413, Cl. 74-1.0SS.

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Kindig, Alan L.: *See*—
Frye, Dale J.; Lindberg, Kenneth M.; Kindig, Alan L.; Stander, Robert J.; Buonodono, Joseph B.; Gras, Jeffrey D.; and Otzios, David A., 4,953,259, Cl. 16-225.000.

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Thakore, Yatin B.; and Stoy, Vladimir, 4,954,145, Cl. 55-16.000.

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Hosaka, Yoshifumi; Otsuka, Saburo; Kinoshita, Takashi; and Ito, Yusuke, 4,954,343, Cl. 424-448.000.

Kioritz Corporation: *See*—
Hironaka, Yoshiaki; Matsubayashi, Tatsuhiko; Kamata, Yoshikiyo; and Tasaki, Takanobu, 4,953,526, Cl. 123-182.000.

Kira, Kazuaki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing an artificial vessel. 4,954,127, Cl. 600-36.000.

Kirby, Alan J.: *See*—
Arsenault, Duane R., 4,953,786, Cl. 238-10.00B.

Kirch, Rudolf, to Dornier System GmbH. Decontamination of waste water. 4,954,230, Cl. 204-149.000.

Kiriake, Masaharu: *See*—
Tone, Shoichi; and Kiriake, Masaharu, 4,953,798, Cl. 242-35.50R.

Kita, Toru; Narumiya, Shuh; Narisada, Masayuki; Watanabe, Fumrhio; Doteuchi, Masami; and Mizui, Takuji, to Shionogi & Co, Ltd. (Ditert-butylhydroxyphenyl)thio derivatives and antiarterioschlerosis compositions thereof. 4,954,514, Cl. 514-381.000.

Kitahara, Satoshi: *See*—
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 4,953,994, Cl. 400-120.000.

Kitamura, Takashi: *See*—
Iimuro, Shigeru; Morimoto, Yoshio; and Kitamura, Takashi, 4,954,661, Cl. 568-727.000.

Kitamura, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Phase adjustment circuit. 4,954,784, Cl. 328-155.000.

Kitaura, Masahiro, to Victor Company of Japan, Ltd. Recursive noise-reducer. 4,954,894, Cl. 358-167.000.

Kitazawa, Toshiyuki, to Asahi Kogaku Kogyo K.K. Motor driven camera. 4,954,859, Cl. 354-173.110.

Kite, Gary W.: *See*—
Beymer, Norman; and Kite, Gary W., 4,953,815, Cl. 248-97.000.

Kitzmiller, James K., to Gifford-Hill & Company, Inc. Method of manufacturing prestressed concrete culverts. 4,953,280, Cl. 29-412.000.

Klecka, Mark D.: *See*—
Morganstein, Sanford J.; Bindl, Ron H.; Klecka, Mark D.; Krakau, Herbert B.; and Dawson, Thomas M., 4,955,047, Cl. 379-112.000.

Klein, Christian; Batz, Hans-Georg; and Herrmann, Rupert, to Boehringer Mannheim GmbH. Resorufin derivatives. 4,954,630, Cl. 544-102.000.

Klein, Manfred, to Deutsche Babcock Werke Aktiengesellschaft. Forced-circulation steam generator. 4,953,509, Cl. 122-6.00A.

Kleiner, Frank: *See*—
Genz, Joachim; Dicke, Hans-Rudolf; Eckhardt, Volker; and Kleiner, Frank, 4,954,604, Cl. 528-125.000.

Kleinschmit, Peter: *See*—
Panster, Peter; and Kleinschmit, Peter, 4,954,599, Cl. 528-38.000.

Kleschik, William A.; Ehr, Robert J.; Costales, Mark J.; Gerwick, Ben C., III; Meikle, Richard W., deceased (by Meikle, Diane); Monte, William T.; and Pearson, Norman R., to Dow Chemical Company, The. Substituted 1,2,4-triazolo[1,5-a]pyrimidine-2-sulfonamides, compositions containing them, and their utility as herbicides. 4,954,163, Cl. 71-92.000.

Klingensmith, George B., to Shell Oil Company. Ethylene-carbon monoxide copolymer stabilization. 4,954,548, Cl. 524-258.000.

Klingman, Kayla R., to Tektronix, Inc. Data driver for multiple mode buffered processor-peripheral data transfer with selective return of data to processor. 4,954,983, Cl. 364-900.000.

Klober, Johannes. Vent pipe coupling. 4,953,897, Cl. 285-226.000.

Kloosterhouse, George. Sanitation shield for water cooler bottle. 4,953,729, Cl. 215-255.000.

Klopfer, Walter; Haug, Fritz; Gabauer, Dale; and Workley, James, to Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG. Device for defect testing of non-ferromagnetic test samples and for ferromagnetic inclusions. 4,954,777, Cl. 324-232.000.

Klossner, Botho; and Lortscher, Paul, to Schweizerische Eidgenossenschaft. Process and apparatus for preparation of finely grained lead azide. 4,954,329, Cl. 423-410.000.

Klosterhaus, Edwin G., to TRW Inc. Fluid power assist rack and pinion steering gear with end-take-off. 4,953,653, Cl. 180-148.000.

Knaack, Karl; and Horbach, Rainier, to Mannesmann AG. Fastening a cable or a drum. 4,953,829, Cl. 254-333.000.

Knasel, Harold E.; and Grigsby, David A., to Process Equipment Company. Safety coupling device for robotic tooling. 4,954,005, Cl. 403-57.000.

Knauf, Werner: *See*—
Koch, Volker; Schnatterer, Stefan; Bonin, Werner; Kern, Manfred; Knauf, Werner; and Waltersdorfer,. Anna, 4,954,529, Cl. 514-594.000.

Knauss, Richard J., to Dresser Industries, Inc. Magnesium aluminate spinel refractory. 4,954,463, Cl. 501-120.000.

Knauth, Jeffrey G.: *See*—
Gray, James P.; Knauth, Jeffrey G.; Pozefsky, Diane P.; and Rafalow, Lee M., 4,954,821, Cl. 340-825.520.

Kneeshaw, Paul G.: *See*—
Pidukalny, Ronald S.; and Kneeshaw, Paul G., 4,954,161, Cl. 71-88.000.

Knoche, Karl F.; Stehmeier, Dieter; and Grabenhenrich, Heinz-Bernd. Process for the operation of a generator absorption heat pump heating installation for space heating, water heating, etc. and generator absorption heat pump heating installation. 4,953,361, Cl. 62-79.000.

Knoespel, Willard R. W.: *See*—
Brothersen, Carl F.; and Knoespel, Willard R. W., 4,954,450, Cl. 435-252.400.

Kobari, Yuji: *See*—
Imaseki, Takashi; and Kobari, Yuji, 4,953,654, Cl. 180-197.000.

Kobayashi, Hideto: *See*—
Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, 4,954,050, Cl. 417-269.000.

Kobayashi, Katsuyuki, to Toyota Jidosha Kabushiki Kaisha. Slidable constant velocity joint. 4,954,120, Cl. 464-141.000.

Kobayashi, Koji: *See*—
Moroto, Shuzo; Kawai, Masao; Yokoyama, Shoji; Kobayashi, Koji; and Sumiya, Koji, 4,954,959, Cl. 364-449.000.

Kobayashi, Mitsuo: *See*—
Takemura, Momoko; Inaba, Michihiko; Tetsuya, Toshio; and Kobayashi, Mitsuo, 4,954,870, Cl. 357-67.000.

Kobayashi, Toshiaki; and Motomatsu, Keiko, to New Japan Chemical Co., Ltd. Crystalline resin compositions. 4,954,291, Cl. 252-315.100.

Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, to Tomoegawa Paper Co., Ltd.; and Hitachi Ltd. Lighting lamp. 4,954,937, Cl. 362-255.000.

Kobayashi, Yoshinobu: *See*—
Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, 4,955,082, Cl. 455-33.000.

Kobayashi, Yuko, to Olympus Optical Co., Ltd. Zoom lens system. 4,953,957, Cl. 350-423.000.

Kobos, Robert K.: *See*—
Eveleigh, John William d.; and Kobos, Robert K., 4,954,444, Cl. 435-181.000.

Kobushi, Kazuhiro; Kameyama, Shuichi; and Komeda, Tadao, to Matsushita Electric Industrial Co., Ltd. Method for fabricating a polycrystalline silicon resistor. 4,954,454, Cl. 437-21.000.

Koch, Frederick W.: *See*—
Denis, Richard A.; and Koch, Frederick W., 4,954,273, Cl. 252-39.000.

Koch, Volker; Schnatterer, Stefan; Bonin, Werner; Kern, Manfred; Knauf, Werner; and Waltersdorfer, Anna, to Hoechst Aktiengesellschaft. (Thio)benzoylureas and functional derivatives thereof, processes for their preparation, agents containing them and their use as agents for combating pests. 4,954,529, Cl. 514-594.000.

Koda, Atsushi; Okuda, Shinji; and Nonaka, Wataru, to Sony Corporation. Automatic cassette changer. 4,954,915, Cl. 360-92.000.

Koda, Hideo H.; and Yoshida, Bill. Optical fuel gauge for vehicles. 4,954,724, Cl. 250-577.000.

Koda, Walter, to Mobil Oil Corporation. Wastebasket having lid hinge and actuating mechanism protector. 4,953,740, Cl. 220-263.000.

Kodama, Churyo: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.

Koenig, Mary K., to Hewlett-Packard Company. Non-commensurate line length rf modulator. 4,954,791, Cl. 332-164.000.

Koerber, Clement J., Sr.; and Boyd, Howard J., to Hill-Rom Company, Inc. Hospital bed for weighing patients. 4,953,244, Cl. 5-60.000.

Koerner, James E.: *See*—
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmalix, Charles K., 4,953,604, Cl. 152-209.00A.

Kogawa, Kuniyuki: *See*—
Kasahara, Mitsuharu; Kogawa, Kuniyuki; and Hirota, Takato, 4,954,798, Cl. 335-161.000.

Kogoh, Kazuhiko: *See*—
Tani, Sumio; Kogoh, Kazuhiko; Nozaki, Yuri; and Oshima, Kunihiro, 4,954,399, Cl. 428-402.000.

Koguchi, Minoru: *See*—
Obitsu, Takeo; Ohnishi, Yutaka; Yoshinaka, Shinji; Koguchi, Minoru; Yanagita, Mitsuhiro; and Hirai, Nobuyuki, 4,954,631, Cl. 546-15.000.

Kohara, Tadashi: *See*—
Okubo, Tadahiko; Takagi, Jun; and Kohara, Tadashi, 4,953,800, Cl. 242-45.000.

Kohl, Albert; and Schunter, Roland, to Henkel Kommanditgesellschaft auf Aktien. Spray extractor. 4,953,254, Cl. 15-320.000.

Kohm, Thomas S., to Kollmorgen Corporation. Method of applying adherent coating on copper. 4,954,185, Cl. 148-282.000.

Kohno, Naoichi; Arai, Masahiro; Aneha, Akira; and Fujisaki, Michio, to Futaba Denshi Kogyo Kabushiki Kaisha. Transmitter for radio control system. 4,954,820, Cl. 340-825.690.

Kohno, Teruhisa: *See*—
Hashida, Koichi; and Kohno, Teruhisa, 4,953,918, Cl. 303-115.000.

Koike, Kazuyuki: *See*—
Matsuyama, Hideo; Koike, Kazuyuki; and Hayakawa, Kazunobu, 4,954,770, Cl. 324-71.300.

Koike, Norio, to Kabushiki Kaisha Toshiba. Formation method and photoresist composition for phosphor screens of color picture tubes. 4,954,418, Cl. 430-175.000.

Koike, Tadao; Noguchi, Koichi; Takahashi, Hiroshi; and Tsunoda, Koichi, to Ricoh Company, Ltd. Copying apparatus operable in a two-side copy mode. 4,954,849, Cl. 355-319.000.

Koizumi, Osamu: *See*—
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 4,953,994, Cl. 400-120.000.

Koizumi, Takashi; and Ishizaka, Hideo, to Fuji Photo Film Co., Ltd. Mechanism for supplying analytical tape for biochemical analysis by predetermined length. 4,954,319, Cl. 422-67.000.

Koizumi, Yukio, to Kabushiki Kaisha Kobe Seiko Sho. Jib stretching and folding device. 4,953,724, Cl. 212-188.000.

Kojima, Akira: *See*—
Otani, Sugio; Kojima, Akira; and Ota, Michiya, 4,954,607, Cl. 528-230.000.

Kojima, Eiji: *See*—
Yoshioka, Hidetoshi; Kojima, Eiji; Ishida, Shuji; Yoshioka, Hiroyuki; and Murakami, Kunichika, 4,954,485, Cl. 514-49.000.

Kojima, Kunio: *See*—
Fuji, Hiroshi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; Terashima, Shigeo; and Fujiwara, Tsuneo, 4,954,903, Cl. 360-46.000.

Kojima, Tetsuro: *See*—
Inoue, Noriyuki; Kojima, Tetsuro; Heki, Tatsuo; and Hirano, Shigeo, 4,954,427, Cl. 430-409.000.

Kojima, Youichi: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,954,235, Cl. 204-273.000.

Kokubun, Yoshikazu; Kurosawa, Akihito; Ushikubo, Kohei; and Todokoro, Shinji, to Sanden Corporation. Vending apparatus for self-service store. 4,954,697, Cl. 235-381.000.

Kollmorgen Corporation: *See*—
Kohm, Thomas S., 4,954,185, Cl. 148-282.000.
Schultz, Roy D.; England, Thomas R.; and Altizer, A. Clark, 4,954,739, Cl. 310-156.000.

Komatsu, Katsuji: *See*—
Yabe, Isao; Komatsu, Katsuji; and Kaneko, Hiroyuki, 4,954,308, Cl. 264-272.170.

Komatsu, Koichi, to Atsugi Motor Parts Company Limited. Power steering valve with two spools of different size to compensate unbalanced cylinder. 4,953,416, Cl. 74-388.0PS.

Komatsu, Takahiro: *See*—
Kumanoya, Masaki; Shinohara, Hirofumi; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Yamasaki, Hiroyuki, 4,954,992, Cl. 365-207.000.

Komeda, Tadao: *See*—
Kobushi, Kazuhiro; Kameyama, Shuichi; and Komeda, Tadao, 4,954,454, Cl. 437-21.000.

Komlev, Alexei M.: *See*—
Urvantsev, Anatoly I.; Elantsev, Jury S.; Komlev, Alexei M.; Kusembaev, Saliman K.; Stepanov, Jury I.; and Vasiliev, Viktor P., 4,954,248, Cl. 209-127.100.

Komori, Teruyuki; Miyake, Shingo; and Senoo, Yoshio, to Tokico Ltd. Brake-friction material. 4,954,536, Cl. 523-149.000.

Komorita, Hiroshi: *See*—
Mizunoya, Nobuyuki; Komorita, Hiroshi; Tanaka, Tadashi; and Matsumura, Kazuo, 4,954,386, Cl. 428-137.000.

Konata, Yoshihiro: *See*—
Iwata, Koji; Okuma, Shigeru; Kimura, Yoshimasa; Konata, Yoshihiro; and Kaneko, Kiyoshi, 4,953,413, Cl. 74-1.0SS.

Kondo, Hiroshi; and Okada, Tadao, to Yamaha Hatsudoki Kabushiki Kaisha. Offset drive for balloon tired motorcycle. 4,953,656, Cl. 180-226.000.

Kondo, Shinichi: *See*—
Sato, Yoshikazu; Watabe, Hiroomi; Ishii, Shigetaka; Nakazawa, Tadashi; Shomura, Takashi; Sezaki, Masaji; and Kondo, Shinichi, 4,954,641, Cl. 549-384.000.
Tsuroka, Takashi; Nakabayashi, Satoru; Matsuhashi, Yuji; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,954,510, Cl. 514-315.000.

Konica Corporation: *See*—
Koshizuka, Kunihiro; and Abe, Takao, 4,954,390, Cl. 428-212.000.
Kurogama, Tatsuji; Kawai, Masanori; Matsushima, Koji; and Watanabe, Mitsuru, 4,954,702, Cl. 250-201.200.
Morita, Shizuo; Matsumoto, Toru; Kamegamori, Masayuki; Hayakawa, Kazushi; Hatakeyama, Noboru; Matsuo, Shunji; and Fukuchi, Masakazu, 4,954,844, Cl. 355-260.000.
Murata, Kazushige; and Nagoshi, Mitsuru, 4,954,847, Cl. 355-318.000.
Nishijima, Toyoki; and Tanji, Masaki, 4,954,431, Cl. 430-546.000.
Nishijima, Toyoki, 4,954,432, Cl. 430-546.000.

Konishi, Nobutake: *See*—
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, 4,954,855, Cl. 357-23.700.

Konishi, Yasuhiro: *See*—
Kumanoya, Masaki; Shinohara, Hirofumi; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Yamasaki, Hiroyuki, 4,954,992, Cl. 365-207.000.

Konsza, Eileen E.: *See*—
Den Hartog, Herman C.; Konsza, Eileen E.; Matthews, James F.; and Werner, Ervin R., Jr., 4,954,559, Cl. 524-507.000.

Konuma, Hiroaki: *See*—
Nakane, Toshio; Kageyama, Yukihiko; Konuma, Hiroaki; and Hijikata, Kenji, 4,954,341, Cl. 524-86.000.

Koo, Young S.: *See*—
Kim, Kwang S.; Chai, Sang Hun; Koo, Young S.; Kim, Yeo H.; and Lee, Jin H., 4,954,456, Cl. 437-31.000.

Korbashov, Jury M.: *See*—
Spirin, Jury L.; Korbashov, Jury M.; Semin, Konstantin V.; and Sigov, Alexandr S., 4,954,771, Cl. 324-158.00R.

Korber, Hans W.; Koster, Reinhard; Linse, Ewald; and Simmat, Dieter, to Ortopedia GmbH. Electric wheel-chair. 4,953,645, Cl. 180-6.500.

Korea Steel Chemical Co., Ltd.: *See*—
Kim, Jong S.; Lee, Ki T.; and Shu, Dong B., 4,954,615, Cl. 528-501.000.

Koreeda, Hiroyuki: *See*—
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.

Koren, Uziel: *See*—
Alferness, Rodney C.; Eisenstein, Gadi; Koren, Uziel; Tien, Ping K.; Tucker, Rodney S.; and Whalen, Matthew S., 4,955,028, Cl. 372-20.000.

Korea Advanced Institute of Science and Technology: *See*—
Kim, Byung-Hong; Kim, Tae-Sung; and Kim, Hae-Yeong, 4,954,229, Cl. 204-130.000.

Kosaka, Hideyuki: *See*—
Noji, Toshiyuki; Yoshida, Hidetoshi; Tatsumi, Eiji; Akao, Shinichi; and Kosaka, Hideyuki, 4,953,330, Cl. 52-167.0DF.

Koseki, Yasuo: *See*—
Hayashi, Nobuatsu; Takahashi, Sankichi; Ebara, Katsuya; Kurokawa, Hideaki; Yamada, Akira; Koseki, Yasuo; Matsuzaki, Harumi; and Yoda, Hiroaki, 4,953,694, Cl. 202-180.000.

Koshida, Hitoshi: *See*—
Takuma, Keisuke; Ohyama, Tsukasa; Ghoda, Isamu; Mikoda, Tamio; Koshida, Hitoshi; and Igata, Akitoshi, 4,954,410, Cl. 430-109.000.

Koshino, Minoru: *See*—
Tateishi, Terutaka; Koshino, Minoru; and Shimizu, Kazuyuki, 4,954,982, Cl. 364-900.000.

Koshizuka, Kunihiro; and Abe, Takao, to Konica Corporation. Thermal transfer recording medium. 4,954,390, Cl. 428-212.000.

Koster, Reinhard: *See*—
Korber, Hans W.; Koster, Reinhard; Linse, Ewald; and Simmat, Dieter, 4,953,645, Cl. 180-6.500.

Kotani, Terumitsu; Taka, Toshio; and Saito, Yoshimasa, to Showa Denko Kabushiki Kaisha. High density polyethylene type transparent film and process for production thereof. 4,954,391, Cl. 428-220.000.

Kotlyar, Oleg, to Eastman Christensen Company. Mud pulse valve and method of valving in a mud flow for sharper rise and fall times, faster data pulse rates, and longer lifetime of the mud pulse valve. 4,953,595, Cl. 137-624.130.

Kotsch, Gary D.; Giles, Philip M., Jr.; and Biemiller, Raymond H., to Bethlehem Steel Corporation. Apparatus for the controlled cooling of hot rolled steel samples. 4,953,832, Cl. 266-82.000.

Kovacs, Mark S. Container system for managing nails, screws and the like. 4,953,764, Cl. 224-151.000.

Koven, Herbert: *See*—
Griffith, Glenn E.; Bustamante, Joaquin; Scheel, Michael D.; and Koven, Herbert, 4,953,777, Cl. 228-119.000.

Koyama, Kunio. Mobile refuse container. 4,953,744, Cl. 220-404.000.

Kozai, Katsuya: *See*—
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.

Kozakai, Hiroshi: *See*—
Ueno, Ryuzo; Fujita, Yatsuka; Yamamoto, Munemitsu; and Kozakai, Hiroshi, 4,954,358, Cl. 426-331.000.

Kozakiewicz, Joseph J.: *See*—
Dauplaise, David L.; Kozakiewicz, Joseph J.; and Schmitt, Joseph M., 4,954,538, Cl. 523-223.000.

Kozawa, Satoshi: *See*—
Iwata, Masayosi; Muto, Toahiya; Morikawa, Minoru; Kozawa, Satoshi; Takase, Akihiko; and Terano, Naoki, 4,954,675, Cl. 200-317.000.

Krakau, Herbert B.: *See*—
Morganstein, Sanford J.; Bindl, Ron H.; Klecka, Mark D.; Krakau, Herbert B.; and Dawson, Thomas M., 4,955,047, Cl. 379-112.000.

Kraus, Willibald, to TRW United Carr GmbH & Co. KG. Plastic sealing cover. 4,953,742, Cl. 220-367.000.

Krause, Walter O.: *See*—
Griffin, Gary E.; and Krause, Walter O., 4,954,252, Cl. 210-136.000.

Krauth, Gary H., to Becton, Dickinson and Company. Indirect colorimetric detection of an analyte in a sample using ratio of light signals. 4,954,435, Cl. 435-7.000.

Krempl, Peter W.; Schindler, Wolfgang; and Schiefer, Erich J., to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof.Dr.Dr.h.c Hans List. Method and a device for measuring the air/fuel ratio of an internal combustion engine. 4,953,390, Cl. 73-116.000.

Kress, Dieter; and Haberle, Friedrich, to Mapal Fabrik fur Prazisionswerkzeuge Dr. Kress KG. Precision boring tool. 4,954,024, Cl. 408-153.000.

Krikorian, Kapriel V.; Rosen, Robert A.; and Li, Frank K., to Hughes Aircraft Company. Range resolving method. 4,954,830, Cl. 342-137.000.

Krishnakumar, Suppayan M.; Nahill, Thomas E.; Schmidt, Steven L.; and Collette, Wayne N., to Continental Pet Technologies, Inc. Two material three/five layer preform. 4,954,376, Cl. 428-35.700.

Kristen, Edward B.; and Guerrero, Juan R., to BASF K & F Corp. Long lasting composition of propafenone and quinidine for treatment of cardiac conditions. 4,954,347, Cl. 424-456.000.

Krober, Ulrich, to Man Roland Druckmaschinen AG. Bearing for rotary press cylinders. 4,953,462, Cl. 101-216.000.

Kross, James R., to Anheuser-Busch Companies, Inc. Conveyor with article alignment. 4,953,688, Cl. 198-434.000.

Krouse, Charles L.: *See*—
Gaffney, John M.; Gelinas, Wilfred R.; Hern, Joel C.; and Krouse, Charles L., 4,953,461, Cl. 101-142.000.

Krubsack, Larry J.; Lawton, John G.; and Handy, Allen L., to Clum Manufacturing Company, Inc. Key lock apparatus. 4,953,420, Cl. 70-366.000.

Kruger, Frans J.: *See*—
Galasko, Philip E.; and Kruger, Frans J., 4,953,393, Cl. 73-146.500.

Krupp Koppers GmbH: *See*—
Jokisch, Friedrich; Linke, Adolf; and Pohl, Hans-Christoph, 4,954,136, Cl. 48-197.00R.

Ku, David N.: *See*—
Powers, James C.; Kam, Chih-Min; Oweida, Steven W.; and Ku, David N., 4,954,519, Cl. 514-456.000.

Kubo, Masahiro: *See*—
Kubota, Shigeru; Kanou, Shoji; and Kubo, Masahiro, 4,953,749, Cl. 221-168.000.

Kubo, Yoichiro; and Ohura, Kiyomori, to Nippon Zeon Co., Ltd. Process for hydrogenating conjugated diene polymers. 4,954,576, Cl. 525-339.000.

Kubota, Kazuyuki: *See*—
Azeta, Takahiro; Kameyama, Toru; Sekiya, Harukazu; Moritani, Toshifumi; Higeta, Akira; Baba, Kenji; Matoba, Takeshi; Goto, Shinji; and Kubota, Kazuyuki, 4,953,846, Cl. 271-251.000.

Kubota Ltd.: *See*—
Ushiro, Kenzo, 4,953,427, Cl. 74-872.000.

Kubota, Shigeru; Kanou, Shoji; and Kubo, Masahiro, to Nitto Kogyo Kabushiki Kaisha. Chip separation and alignment apparatus. 4,953,749, Cl. 221-168.000.

Kuchemann, Rudi: *See*—
Appel, Eggert; Kiene, Wilfried; Kuchemann, Rudi; Meier, Dieter; and Nissen, Peter, 4,953,408, Cl. 73-861.160.

Kuchiki, Kiyotsuna: *See*—
Saotome, Yoshimi; Kuchiki, Kiyotsuna; and Katada, Tsuyoshi, 4,953,723, Cl. 212-159.000.

Kuchta, Richard; Billings, Larry; Evenzon, Vladimir; and Bristow, Donald, to Gerber Garment Technology, Inc. Selectively positionable variable height workstation and method of use. 4,953,469, Cl. 104-127.000.

Kudou, Jinko: *See*—
Sakamoto, Kiichi; Yasuda, Hiroshi; Yamada, Akio; and Kudou, Jinko, 4,954,717, Cl. 250-492.300.

Kuehl, Guenter H.; and Rosinski, Edward J., to Mobil Oil Corporation. Catalytic cracking with framework aluminum extracted zeolite. 4,954,243, Cl. 208-120.000.

Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Faith, William C., to Rorer Pharmaceutical Corporation. Pyridyl-pyridazinone and pyridyl-pyrazolinone compounds and their use in the treatment of congestive heat failure. 4,954,494, Cl. 514-210.000.

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Memminger, Gustav; Fabschitz, Heinz; and Kuhn, Falk, 4,953,367, Cl. 66-132.00R.

Kuhn S.A.: *See*—
Aron, Jerome, 4,953,346, Cl. 56-11.100.

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Kumar, Shalabh; and Edgar, Duane, to Micro Fast Controls, Inc. Resolver analog to digital input module for use in a programmable controller system. 4,954,763, Cl. 318-605.000.

Kumar, Viraraghavan S., to Puritan-Bennett Corporation. Proportional electropneumatic solenoid-controlled valve. 4,954,799, Cl. 335-236.000.

Kumiai Chemical Industry Co., Ltd.: *See*—
Miyazawa, Takeshige; and Kawano, Kazuhiko, 4,954,157, Cl. 71-86.000.

Kummer, Ludwig: *See*—
Esswein, Karlheinz; and Kummer, Ludwig, 4,953,962, Cl. 350-507.000.

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Ohtake, Toshikazu; Hayashi, Munekazu; Idemura, Satoshi; Ohi, Kazumi; and Kunitake, Yuji, 4,954,304, Cl. 264-137.000.

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Kuppers, Dieter; Herse, Klaus; Hiepe-Wohlleben, Kate; Kaiser, Manfred; Mohr, Friedemann; and Ohnsorge, Horst, to Alcatel N.V. Broadband optical communication system, particularly in the subscriber area. 4,955,014, Cl. 370-3.000.

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Tani, Sumio; Kogoh, Kazuhiko; Nozaki, Yuri; and Oshima, Kunihiro, 4,954,399, Cl. 428-402.000.

Kurashima, Toshiaki: *See*—
Takahashi, Hiroyuki; and Kurashima, Toshiaki, 4,953,592, Cl. 137-599.100.

Kuratani, Fumiyasu: *See*—
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Kuribayashi, Kiyoshi: *See*—
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Sasaki, Akira; Esaki, Seiji; Hashimoto, Yasushi; and Kurita, Shigeo, 4,954,119, Cl. 464-111.000.

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Hayashi, Nobuatsu; Takahashi, Sankichi; Ebara, Katsuya; Kurokawa, Hideaki; Yamada, Akira; Koseki, Yasuo; Matsuzaki, Harumi; and Yoda, Hiroaki, 4,953,694, Cl. 202-180.000.

Kurokawa, Hideo: *See*—
Nakamura, Sigemi; Kurokawa, Hideo; and Mitamura, Jouji, 4,954,341, Cl. 424-70.000.

Kurosaki Refractories Co., Ltd.: *See*—
Harada, Tsutomu; and Shikano, Hiroshi, 4,954,535, Cl. 523-139.000.

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Kokubun, Yoshikazu; Kurosawa, Akihito; Ushikubo, Kohei; and Todokoro, Shinji, 4,954,697, Cl. 235-381.000.

Kurose, Yutaka: *See*—
Maeda, Shuichi; Kaneko, Toshio; Kurose, Yutaka; Kimura, Michiyo; Yoshida, Hidemi; Uchino, Kenichi; and Inaba, Shizue, 4,954,420, Cl. 430-270.000.

Kurt, Ewald H. Quick detach bit. 4,953,640, Cl. 175-320.000.

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Yano, Kanji; Saijo, Yasutsugu; Kusaka, Kensaku; and Hirabayashi, Hiromitsu, 4,954,845, Cl. 355-290.000.

Kusembaev, Saliman K.: *See*—
Urvantsev, Anatoly I.; Elantsev, Jury S.; Komlev, Alexei M.; Kusembaev, Saliman K.; Stepanov, Jury I.; and Vasiliev, Viktor P., 4,954,248, Cl. 209-127.100.

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Kusmer, Daniel P.; and Yohner, Paul A., to Keystone International Holdings Corp. Apparatus for inserting valve seats in valve bodies. 4,953,276, Cl. 29-235.000.

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Kuwano, Hiromichi: *See*—
Ishikawa, Shuichi; and Kuwano, Hiromichi, 4,954,766, Cl. 323-272.000.

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Yamada, Takashi; Arimune, Hisao; and Maeda, Takashi, 4,954,232, Cl. 204-192.230.

Kyowa Hakko Kogyo Co. Ltd.: *See*—
Katsumata, Ryoichi; Mizukami, Toru; and Oka, Tetsuo, 4,954,441, Cl. 435-115.000.

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Iwanami, Teruo; Miyata, Shigeo; and Moriyama, Takamasa, 4,954,557, Cl. 524-399.000.

La Telemecanique Electrique: *See*—
Claude, Jullien, 4,954,928, Cl. 361-391.000.

Labinal: *See*—
Nadin, Leonard, 4,954,093, Cl. 439-188.000.

Labsystems Oy: *See*—
Tervamaki, Jukka, 4,953,575, Cl. 134-57.00R.

Ladang, Michel: *See*—
Comert, Ahmet; Ladang, Michel; and Petit, Dominique, 4,953,885, Cl. 280-610.000.

Ladd, Joseph M., Jr.: *See*—
Wierenga, Thomas J.; Ladd, Joseph M., Jr.; Merz, Russell J.; and Nicholson, Alyce E., 4,954,285, Cl. 252-174.110.

Lai, Motor, to Regitar Power Tools Co., Ltd. Electric stapling gun with auto-reset, energy-saving and shock-absorbing functions. 4,953,774, Cl. 227-131.000.

Laiho, Kalevi: *See*—
Haarasilta, Asko; Vuorenlinna, Leo; and Laiho, Kalevi, 4,954,355, Cl. 426-61.000.

Lamberton, Bruce A., to Lamberton, Jacquelyn. Means and method for stabilizing shorelines. 4,954,013, Cl. 405-25.000.

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Lamberton, Bruce A., 4,954,013, Cl. 405-25.000.

Lambooy, Elbert, to Stichting Instituut Voor Veeteeltkundig Onderzoek "Schoonoord". Process for stunning livestock. 4,953,263, Cl. 17-1.00E.

Lamprecht, Josef; Ley, Gregor; Werner, Arend; and Barzynski, Helmut, to BASF Aktiengesellschaft. Recording material containing a layer of polymer particles and a superimposed metallic layer. 4,954,422, Cl. 430-275.000.

Lancaster, Patrick R., III; and Lancaster, William G., to Lantech, Inc. High tensile wrapping apparatus. 4,953,336, Cl. 53-556.000.

Lancaster, William G.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,953,336, Cl. 53-556.000.

Lanciaux, Jacques, to Rockwell-Collins France. Radiodirection finding method and apparatus using doppler effect frequency modulation. 4,954,835, Cl. 342-418.000.

Lande, Goran, to Norabel AB. Method of effecting a single joint between two pipes. 4,953,775, Cl. 228-107.000.

Landes, Scott D. Garment bag apparatus. 4,953,674, Cl. 190-108.000.

Lang, David J.: *See*—
Elliott, David L.; Christiano, Steven P.; Lang, David J.; and Sisco, Rosemary M., 4,954,280, Cl. 252-90.000.

Lang, Gary D.; Finan, Donald S.; and Rhoades, George D., to Liquid Carbonic Corporation. Helical conveyor freezer. 4,953,365, Cl. 62-381.000.

Lang, Gunther; Maresch, Gerhard; and Lenz, Hans-Rudi, to Wella Aktiengesellschaft. O-benzyl-N-hydroxyalkyl derivatives of chitosan and nail polish containing the same. 4,954,619, Cl. 536-20.000.

Langen, Hans-Jurgen: *See*—
Coenen, Karl; Flanhardt, Michael; and Langen, Hans-Jurgen, 4,953,411, Cl. 73-862.330.

Langford, Frederic E., to Phoenix Engineering, Inc. Track suspension system. 4,953,919, Cl. 305-31.000.

Langsam, Michael: *See*—
Burgoyne, William F., Jr.; Langsam, Michael; and Fowlkes, Robert L., 4,954,144, Cl. 55-16.000.

Langsdorf, John W.; and Outlaw, Tina O., to General Mills, Inc. Leak detector for containers. 4,953,396, Cl. 73-49.300.

Lantech, Inc.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,953,336, Cl. 53-556.000.

Lanzetta, Carmen, Jr.; Kieli, Michael; Schindler, Guenter; and Williams, Russell H., to Thomas & Betts Corporation. Optical fiber termination device having cutting means. 4,953,940, Cl. 350-96.200.

Larsson, Nils H. I., to Nomafa AB. Safety device, particularly for roll-up doors. 4,953,608, Cl. 160-1.000.

Laser Dynamics, Inc.: *See*—
Clements, Ken, 4,954,875, Cl. 357-75.000.

Latilla Holdings (Guernsey) Limited: *See*—
Maud, John R.; and Cooper, Allan S., 4,954,840, Cl. 346-93.000.

Lattanzi, Filippo; and Vanni, Riccardo, to Sclavo S.p.A. Pharmaceutical composition for intrarectal administration of a calcitonin and unit dosage forms prepared therefrom. 4,954,342, Cl. 424-436.000.

Latz, Rudolf; and Martens, Thomas, to Leybold Aktiengesellschaft. Apparatus for etching substrates with a luminous discharge. 4,954,201, Cl. 156-345.000.

Lauks, Imants R.; and Zelin, Michael P., to I-Stat Corporation. Static-free interrogating connector for electric components. 4,954,087, Cl. 439-71.000.

Laurer, Erwin: *See*—
Schabert, Hans-Peter; Strickroth, Erich; and Laurer, Erwin, 4,953,580, Cl. 285-23.000.

Lawrence, Bruce J.: *See*—
Leis, Michael; Engelson, Gary S.; and Lawrence, Bruce J., 4,954,788, Cl. 331-16.000.

Lawton, John G.: *See*—
Krubsack, Larry J.; Lawton, John G.; and Handy, Allen L., 4,953,420, Cl. 70-366.000.

Lazzari, Jean-Pierre, to Commissariat a l'Energie Atomique. Device for communicating between two media separated by a slotted wall. 4,953,424, Cl. 74-566.000.

Le, Hanh T., to Conco Inc. Oil compositions containing terpolymers of alkyl acrylates or methacrylates, an olefinically unsaturated homo or heterocyclic-nitrogen compound and allyl acrylates or methacrylates. 4,954,135, Cl. 44-62.000.

Leary, Joseph E.; and Parr, Edward L. Distillation apparatus. 4,954,223, Cl. 203-1.000.

Leary, Lynn; and Schumann, Ronald C., to Cincinnati Milacron Inc. Thermoforming and conveyor chain guide apparatus. 4,954,066, Cl. 425-388.000.

Leatherhead Shop, Inc.: *See*—
Boose, Raymond N., 4,953,345, Cl. 54-6.00R.

LeBegue, Maurice K., to Baker Hughes Incorporated. Mining machine with roof bolting apparatus. 4,953,914, Cl. 299-11.000.

LeBlanc, Ewart O.: *See*—
Jedlicka, Josef E.; LeBlanc, Ewart O.; and Masseth, Judith A., 4,954,197, Cl. 156-273.700.

Leboime, Pierre, to Zone Industrielle d'Epluches. Transmission systems for high-speed track-laying vehicles or vehicles with non-steerable wheels. 4,953,647, Cl. 180-9.100.

Le Bris, Jean; Erman, Marko; and Gillardin, Gerard, to U.S. Philips Corporation. Device for characterizing semiconductor samples by photoluminescence with high spatial resolution and at low temperature. 4,954,713, Cl. 250-458.100.

Lebron, Fernando C., to London Health Association. Magnetic field alarm indicator. 4,954,812, Cl. 340-551.000.

LeCompte, George W., to Hughes Aircraft Company. Filament winding apparatus. 4,953,803, Cl. 242-47.000.

Lecoy, Pierre; and Wilbrod, Jean-Hubert. Process and device for regulating the light power of laser diodes. 4,955,029, Cl. 372-31.000.

Lederman, Frederick E., to General Motors Corporation. Roller clutch for stator assembly. 4,953,353, Cl. 60-345.000.

Lee, Chang H.; and Kim, Young J. Automatic mixing faucet. 4,953,236, Cl. 4-194.000.

Lee, Chune: *See*—
Lee, James; Beck, Richard; Lee, Chune; and Hu, Edward, 4,954,873, Cl. 357-72.000.

Lee, Fu M.: *See*—
Brown, Ronald E.; and Lee, Fu M., 4,954,224, Cl. 203-51.000.

Lee, James; Beck, Richard; Lee, Chune; and Hu, Edward, to Digital Equipment Corporation. Electrical connector for surface mounting. 4,954,873, Cl. 357-72.000.

Lee, Jay; and Mauro, Alex, to Robotic Vision Systems, Inc. Sealant bead profile control. 4,954,059, Cl. 425-72.100.

Lee, Jin H.: *See*—
Kim, Kwang S.; Chai, Sang Hun; Koo, Young S.; Kim, Yeo H.; and Lee, Jin H., 4,954,456, Cl. 437-31.000.

Lee, Ki T.: *See*—
Kim, Jong S.; Lee, Ki T.; and Shu, Dong B., 4,954,615, Cl. 528-501.000.

Lee, Min-Hsiun; and Pendergraft, Paul T., to Amoco Corporation. Sulfur recovery process using metal oxide absorbent. 4,954,331, Cl. 423-574.00R.

Lee, Robert D.; Mounger, Robert W.; and Heptig, John P., to Dallas Semiconductor Corporation. Low-power RF receiver. 4,955,038, Cl. 375-35.000.

Lee, Robert G.: *See*—
Elrod, Jimmie L.; and Lee, Robert G., 4,954,155, Cl. 71-28.000.

Lee, Shin H., to Samsung Electronics Co., Ltd. Suction guide device for dehumidifier. 4,953,364, Cl. 62-285.000.

Lee, Sungmuk; and Misono, Shigemi, to Mead Corporation, The; and Seiko Instruments Inc. Exposure apparatus for color imaging system. 4,954,862, Cl. 355-1.000.

Lee, Weng-Jay: *See*—
Chen, Chung-Mei; Yang, Jenn Fu; Lee, Weng-Jay; Lin, Tsai-Sheng; and Tsay, Yung-Hsing, 4,953,710, Cl. 209-518.000.

Lee, Y.-W: *See*—
Cook, C. Edgar; Wani, Mansukh C.; Lee, Y.-W; Reel, Jerry R.; and Rector, Douglas, 4,954,490, Cl. 514-176.000.

Leff, Aaron N.: *See*—
Leff, Ruth B.; and Leff, Aaron N., 4,954,083, Cl. 434-112.000.

Leff, Ruth B.; and Leff, Aaron N. Communication aid. 4,954,083, Cl. 434-112.000.

LeFriec, Fred: *See*—
Sims, Louis; LeFriec, Fred; Dubner, Joseph; and Peavey, Brian, 4,953,995, Cl. 400-121.000.

Leftheris, Basil P.; and Schwarz, Robert C., to Grumman Aerospace Corporation. Detection of compressive residual stresses using the method of caustics. 4,953,973, Cl. 356-32.000.

Legat, Denis: *See*—
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Legrand: *See*—
Baillet, Alain; Loisel, Francois; and Paulin, Daniel, 4,953,384, Cl. 72-410.000.

Legras, Olivier R.: *See*—
Dieulesaint, Eugene J.; Royer, Daniel R.; and Legras, Olivier R., 4,954,997, Cl. 367-13.000.

Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., to Baker Hughes Incorporated. Subterranean well casing float tool. 4,953,622, Cl. 166-327.000.

Lehr, Erich; Bechtel, Wolf-Dietrich; Boke-Kuhn, Karin; Schneider, Claus; Walther, Gerhard; and Weber, Karl-Heinz, to Boehringer Ingelheim KG. Use of 1-benzyl-aminoalkyl-pyrrolidinones as antidepressants. 4,954,516, Cl. 514-424.000.

Lehr, Lothar: *See*—
Reuter, Wolfgang; Debus, Jurgen; and Lehr, Lothar, 4,953,821, Cl. 248-276.000.

Lehtonen, Kari, to Tunturipyora Oy. Arrangement for converting reciprocating motion into even rotational motion. 4,953,415, Cl. 74-141.000.

Leis, Michael; Engelson, Gary S.; and Lawrence, Bruce J., to Digital Equipment Corporation. Phase locked loop with bandwidth ramp. 4,954,788, Cl. 331-16.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Yoh, Kanji, 4,954,730, Cl. 307-451.000.

Lemire, Brett J. Orthopedic back support attachment for a weight lifter's bench. 4,953,857, Cl. 272-123.000.

Lemire, Gilbert. Decorative module having a concave face. 4,954,374, Cl. 428-34.100.

Lemnios, Zachary, to Ford Microelectronics, Inc. Sputtered metallic silicide gate for GaAs integrated circuits. 4,954,852, Cl. 357-15.000.

Lemper, Herbert. Modular continuous caster. 4,953,614, Cl. 164-416.000.

Lenz, Hans-Rudi: *See*—
Lang, Gunther; Maresch, Gerhard; and Lenz, Hans-Rudi, 4,954,619, Cl. 536-20.000.

Leonard, Tracey M.: *See*—
Stein, Judith; Leonard, Tracey M.; and Desorcie, James L., 4,954,364, Cl. 427-54.100.

Leonberger, Frederick J.: *See*—
Suchoski, Paul G., Jr.; Findakly, Talal K.; and Leonberger, Frederick J., 4,953,935, Cl. 350-96.160.

Leong, Chee S.: *See*—
Wong, Soon F.; Leong, Chee S.; and Ng, Cher Y., 4,955,071, Cl. 455-90.000.

Lerman, Ori; and Rozen, Shlomo, to Ramot University Authority of Applied Research and Industrial Development Ltd.; and ICL Industries Ltd. Method for the bromination of aromatic compound. 4,954,648, Cl. 558-425.000.

Les Entrepots Dupont et Lanctot Inc.: *See*—
Tremblay, Raymond, 4,953,571, Cl. 131-231.000.

Lescaut, Emmanuel, to Automobiles Peugeot; and Automobile Citroen, a part interest. Coupling arrangement in power steering for vehicles. 4,953,651, Cl. 180-132.000.

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Lesparre, Jean: *See*—
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L'Etat Francais represente par le Ministre des Postes et Telecommunications: *See*—
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Leupold, Herbert A.; and Potenziani, Ernest, II, to United States of America, Army. Permanent magnet structure for a nuclear magnetic resonance imager for medical diagnostics. 4,953,555, Cl. 128-653.00A.

Leuzzi, Paul W., II: *See*—
Gerkin, Richard M.; Jorgenson, Michael W.; and Leuzzi, Paul W., II, 4,954,560, Cl. 524-714.000.

Lever Brothers Company: *See*—
Butterworth, Robert M.; and Saunders, Kenwyn D., 4,954,270, Cl. 252-8.800.
Elliott, David L.; Christiano, Steven P.; Lang, David J.; and Sisco, Rosemary M., 4,954,280, Cl. 252-90.000.
Hull, Michael; and Scowen, Reginald V., 4,954,292, Cl. 252-542.000.
Resch, Carol M., 4,954,281, Cl. 252-107.000.
Rys, Karla J.; Greene, Alan P.; Osmer, Frederick S.; and Podgorsky, Joseph J., 4,954,282, Cl. 252-117.000.
Sepulveda, Ralph R.; and Lynn, Jesse L., Jr., 4,954,286, Cl. 252-174.220.
Wesdorp, Leendert H.; and Struik, Mattheus, 4,954,362, Cl. 426-602.000.

Levine, Neil A. Finger worn graphic interface device. 4,954,817, Cl. 340-706.000.

Levine, Robert A.; and Wardlaw, Stephen C. Correction of material layer volume measurements. 4,953,975, Cl. 356-246.000.

Levy, Mark A.: *See*—
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., 4,954,446, Cl. 435-184.000.

Levy, Moshe: *See*—
Cabasso, Israel; and Levy, Moshe, 4,954,381, Cl. 428-116.000.

Lewis, Brian G., to Olin Corporation. Electromagnetic solder tinning system. 4,953,487, Cl. 118-620.000.

Lewis, David F.; and Schenfele, Robert D., to GAF Chemicals Corporation. Coating for increasing sensitivity of a radiation imageable polyacetylenic film. 4,954,428, Cl. 430-495.000.

Lewis, David F.; and Schenfele, Robert D., to GAF Chemicals Corporation. Coating for increasing sensitivity of a radiation imageable polyacetylenic film. 4,954,543, Cl. 524-104.000.

Lewis, Larry N.; and Bunnell, Stephen C., to General Electric Company. Substantially transparent flame retardant aromatic polycarbonate compositions. 4,954,549, Cl. 524-264.000.

Ley, Gregor: *See*—
Lamprecht, Josef; Ley, Gregor; Werner, Arend; and Barzynski, Helmut, 4,954,422, Cl. 430-275.000.

Leybold Aktiengesellschaft: *See*—
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Kessler, Hans, 4,953,497, Cl. 118-718.000.
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Li, Frank K.: *See*—
Krikorian, Kapriel V.; Rosen, Robert A.; and Li, Frank K., 4,954,830, Cl. 342-137.000.

Li, H. L.; and Prevorsek, D. C., to Allied-Signal Inc. Impact resistant helmet. 4,953,234, Cl. 2-412.000.

Lia, Peder, to Modum Stiger a.s. Safety device for chicks in automatic poultry feeders. 4,953,505, Cl. 119-57.200.

Libbey, Christopher J.: *See*—
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., 4,953,544, Cl. 128-156.000.

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Rosario-Jansen, Theresa; and Lichtenwalter, Glen D., 4,954,635, Cl. 548-354.000.

Liebich, Ernst; and Longueville, Jacques, to Siemens Aktiengesellschaft. Press in contact element for circuit boards. 4,954,103, Cl. 439-751.000.
Liere, Merle V. Steam chamber. 4,953,454, Cl. 99-426.000.
Lifeblood Advanced Blood Bank Systems, Inc.: *See*—
Harms, Frank M.; Tripp, Victor; and Wells, Thomas B., 4,954,679, Cl. 219-10.55M.
Liles, Donald T., to Dow Corning Corporation. Precured silicone emulsion. 4,954,565, Cl. 524-860.000.
Limpert, Rudolf: *See*—
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Lin, Fong C.: *See*—
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Lin, Tsai-Sheng: *See*—
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Lindberg, Kenneth M.: *See*—
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Lingo, Lowell, Jr. Method and system for recovering free floating liquids from ground water. 4,954,266, Cl. 210-747.000.
Linke, Adolf: *See*—
Jokisch, Friedrich; Linke, Adolf; and Pohl, Hans-Christoph, 4,954,136, Cl. 48-197.00R.
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Korber, Hans W.; Koster, Reinhard; Linse, Ewald; and Simmat, Dieter, 4,953,645, Cl. 180-6.500.
Lion Corporation: *See*—
Nakamura, Sigemi; Kurokawa, Hideo; and Mitamura, Jouji, 4,954,341, Cl. 424-70.000.
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Lo, Peter K. Wind-drag type exercise bicycle with pedals disposed in front of the seat thereof. 4,953,850, Cl. 272-73.000.
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Loscuito, Gaetano R. Electrical outlet box marking device. 4,953,733, Cl. 220-3.400.
Loucas, Theodore. Rim offset gauge. 4,953,307, Cl. 33-600.000.
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Lyons, Donald D. Waterproof hinged panel assembly. 4,953,261, Cl. 16-354.000.

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Salzer, Donald E.; and Maassen, Nevil Q., 4,954,708, Cl. 250-352.000.

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Maeda, Shuichi; Kaneko, Toshio; Kurose, Yutaka; Kimura, Michiyo; Yoshida, Hidemi; Uchino, Kenichi; and Inaba, Shizue, to Mitsubishi Kasei Corporation. Metal-containing indoaniline compound and optical recording medium employing the compound. 4,954,420, Cl. 430-270.000.

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Malaczynski, Gerard W.; and Schroeder, Thaddeus, to General Motors Corporation. Ion-drag flowmeter. 4,953,407, Cl. 73-861.090.

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Mallouk, Robert S.; Branca, Phillip A.; and Perry, Randal L. Fabric reinforced composite membrane. 4,954,388, Cl. 428-198.000.

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Marchildon, Ernest K. A.; Muzyka, Douglas W.; and Dumoulin, Michel M., to Du Pont Canada, Inc. Process for controlling quality of yarns. 4,954,302, Cl. 264-40.100.
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Marino, John G.; and Topputo, Michael. Male element for heavy duty snap fastener. 4,953,267, Cl. 24-682.000.
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Dieulesaint, Eugene J.; Royer, Daniel R.; and Legras, Olivier R., 4,954,997, Cl. 367-13.000.
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Matsubara, Tetsuyuki: *See*—
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Matsuhashi, Yuji: *See*—
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Oikawa, Hiroshi; Nakashima, Naohisa; Matsuhisa, Tadaaki; and Ozawa, Tadao, 4,953,528, Cl. 123-276.000.
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Matsumoto, Yukio; Saito, Horiyuki; and Morita, Kuniki, to Murata Hatsujo Co. Ltd. Wire for coiled spring. 4,953,835, Cl. 267-180.000.
Matsumura, Kazuo: *See*—
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Imoto, Katsuyuki; Sano, Hirohisa; Miyazaki, Masaru; Matsuoka, Naoyuki; and Uetsuka, Hisato, 4,953,934, Cl. 350-96.150.
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Matsushita Electric Industrial Co., Ltd.: *See*—
Aoki, Masaki; Torii, Hideo; Kuribayashi, Kiyoshi; Monji, Hideto; Umetani, Makoto; and Fujii, Eiji, 4,953,385, Cl. 72-462.000.
Inoda, Kenichi; and Harada, Terumaru, 4,954,053, Cl. 417-379.000.
Ishii, Kazunori; Terakado, Seishi; Funakoshi, Yasutomo; and Sakairi, Tadashi, 4,954,696, Cl. 219-548.000.
Kitamura, Tsutomu, 4,954,784, Cl. 328-155.000.
Kobushi, Kazuhiro; Kameyama, Shuichi; and Komeda, Tadao, 4,954,454, Cl. 437-21.000.

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Matsuyama, Hideo; Koike, Kazuyuki; and Hayakawa, Kazunobu, to Hitachi, Ltd. Spin-polarization detector. 4,954,770, Cl. 324-71.300.

Matsuzaki, Atsushi: *See—*
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Matsuzaki, Harumi: *See—*
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Matsuzaki, Kunimitsu: *See—*
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Matsuzaki, Yuji: *See—*
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Mattheissen, Hans, to Dragerwerk Aktiengesellschaft. Circuit arrangement for driving a pulse-modulated infrared-radiation source. 4,954,718, Cl. 250-493.100.

Matthews, Billie D.: *See—*
Sudakoff, Carle H.; and Matthews, Billie D., 4,953,880, Cl. 280-47.380.

Matthews, James F.: *See—*
Den Hartog, Herman C.; Konsza, Eileen E.; Matthews, James F.; and Werner, Ervin R., Jr., 4,954,559, Cl. 524-507.000.

Matthews, O. H. Cubicle bed. 4,953,246, Cl. 5-424.000.

Mattison, Lawrence A. Decorative smoke detector construction. 4,954,816, Cl. 340-693.000.

Mattox, John R., to Rohm and Haas Company. Microbicidal microemulsion. 4,954,338, Cl. 424-78.000.

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Smith, David W.; Yocca, Frank D.; Yevich, Joseph P.; and Mattson, Ronald J., 4,954,502, Cl. 514-253.000.

Maud, John R.; and Cooper, Allan S., to Latilla Holdings (Guernsey) Limited. Automatic ticket dispenser. 4,954,840, Cl. 346-93.000.

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Mauser-Werke Oberndorf GmbH: *See—*
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Mausner, Eberhard: *See—*
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Max G. Futch: *See—*
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Maxwell, Thomas P.: *See—*
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Mayer, Stefan; and Schmidt, Susanne, to Heinrich-Hertz-Institut fur Nachrichtentechnik Berlin GmbH. Electronic projector system such as a high definition television (HDTV) projection television system or the like having a fluid therein with increased resistance to damage from projection system radiation. 4,954,896, Cl. 358-234.000.

Mayne, Clive: *See—*
MacDonald, Lindsay; Mayne, Clive; and Rassool, Reza P., 4,954,912, Cl. 358-448.000.

Mazda Motor Company: *See—*
Ohmura, Hiroshi, 4,953,650, Cl. 180-79.100.

Mazda Motor Corporation: *See—*
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Ohmura, Hiroshi, 4,953,648, Cl. 180-79.100.
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McCartherens, Stone W. Polishing glove apparatus. 4,953,998, Cl. 401-7.000.

McCarty, Jerry. Disposable respiratory medication dispersion chamber. 4,953,545, Cl. 128-200.230.

McCavey, William M. Wire tying tool for concrete reinforcing steel. 4,953,598, Cl. 140-57.000.

McCleerey, Earl W., to AMP Incorporated. Ribbon crossover cable assembly and method. 4,954,100, Cl. 439-492.000.

McClendon, Zach, Jr. Method for molding large plastic unitary core boats. 4,953,494, Cl. 114-357.000.

McCormack, Michael: *See—*
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McDonald, Francis X.; Weisel, Eric M.; and Schukei, Glen E., to Combustion Engineering, Inc. Remotely installed steam generator nozzle dam system. 4,954,312, Cl. 376-260.000.

McDonald, Joseph C.: *See—*
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McDonnell Douglas Corporation: *See—*
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McGlothlin, Mark W.; and DePaul, Alice A., to Apex Medical Technologies, Inc. Method of forming a polymeric casing with textured surface. 4,954,309, Cl. 264-307.000.

McGovern, Kevin M.; and Schoenhals, Robert C., to Eaton Corporation. Torsion damping mechanism for a supercharger. 4,953,517, Cl. 123-559.100.

McGowan, Vince J., to GSW Inc. Gutter seal. 4,954,015, Cl. 405-121.000.

McMann, Ronald E.; Garcia, Evaristo, Jr.; Welch, Michael T.; and Thompson, Stephen W., to Texas Instruments Incorporated. Planar metal interconnection for a VLSI device. 4,954,423, Cl. 430-316.000.

McMorries, Lee W., IV, to Brunswick Corporation. Water pickup insert. 4,954,109, Cl. 440-78.000.

McMurry, Alan D.: *See—*
Bledsoe, Steven W.; and McMurry, Alan D., 4,955,012, Cl. 367-154.000.

McWilliams, John P.: *See—*
Marler, David O.; and McWilliams, John P., 4,954,663, Cl. 568-791.000.

Mead, Carver A.: *See—*
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Mead Corporation, The: *See—*
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Beery, Jack; and Joiner, Charles W., Jr., 4,954,297, Cl. 264-1.300.
Davis, Paul D.; Schuster, Gary B.; Truini, Jacqueline G.; and Fentiman, Al, 4,954,415, Cl. 430-138.000.
Lee, Sungmuk; and Misono, Shigemi, 4,954,862, Cl. 355-1.000.
Spamer, William S., 4,953,719, Cl. 211-188.000.

Mears, Robert J.; Reekie, Laurence; Poole, Simon B.; and Payne, David N. Fibre-optic lasers and amplifiers. 4,955,025, Cl. 372-6.000.

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Fogaroli, Giuseppe; Coli, Giuseppe; Tadini, Giorgio; and Meazza, Giampiero, 4,954,888, Cl. 358-75.000.

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Medtronic, Inc.: *See—*
Berthelsen, Wendy A., 4,953,564, Cl. 128-784.000.
Mehra, Rahul; and Combs, William, 4,953,551, Cl. 128-419.00D.

Meek, John R. Tamper proof bottle. 4,953,728, Cl. 215-250.000.

Meester, Jacobus, to TS AGRO Products IM-Export B.V. Grading rolls for agricultural, horticultural and other articles. 4,953,712, Cl. 209-669.000.

Meffert, Alfred: *See—*
Schmid, Karl H.; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Scharf, Rolf, 4,954,283, Cl. 252-135.000.

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Meier, Dieter: *See—*
Appel, Eggert; Kiene, Wilfried; Kuchemann, Rudi; Meier, Dieter; and Nissen, Peter, 4,953,408, Cl. 73-861.160.

Meier, Ghert, to Contraves AG. Device for the alignment of an aiming axis body at a target position. 4,953,443, Cl. 89-41.020.

Meiji Seika Kaisha, Ltd.: *See—*
Sato, Yoshikazu; Watabe, Hiroomi; Ishii, Shigetaka; Nakazawa, Tadashi; Shomura, Takashi; Sezaki, Masaji; and Kondo, Shinichi, 4,954,641, Cl. 549-384.000.
Tachibana, Shunro; and Shibata, Uichi, 4,953,565, Cl. 128-798.000.
Tsuroka, Takashi; Nakabayashi, Satoru; Matsuhashi, Yuji; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,954,510, Cl. 514-315.000.

Meikle, Diane: *See—*
Kleschik, William A.; Ehr, Robert J.; Costales, Mark J.; Gerwick, Ben C., III; Meikle, Richard W., deceased; Monte, William T.; and Pearson, Norman R., 4,954,163, Cl. 71-92.000.

Meikle, Richard W., deceased: *See—*
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Meinke, Joseph S.: *See—*
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Memminger, Gustav; Fabschitz, Heinz; and Kuhn, Falk, to Memminger Iro GmbH. System for controlling supply of yarn to a yarn utilization apparatus, particularly multi-feed circular knitting machine. 4,953,367, Cl. 66-132.00R.

Memminger Iro GmbH: *See—*
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Mendes, Luiz N.: *See*—
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Menicon Co., Ltd: *See*—
Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, 4,954,586, Cl. 526-245.000.
Menigaux, Louis; and Dugrand, Louis, to L'Etat Francais represente par le Ministre des Postes et Telecommunications; and Centre National d'Etudes des Telecommunications. Method of manufacturing a semiconductor structure suitable for producing a multi-wavelength laser effect, and device obtained thereby. 4,955,030, Cl. 372-44.000.
Mennuto, Anthony R., to Metal Industries, Inc. Balancing arrangement for double hung windows. 4,953,258, Cl. 16-197.000.
Messinger, Michael C.: *See*—
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Merck & Co., Inc.: *See*—
Young, Robert N.; Rokach, Joshua; and Hayes, Edward C., 4,954,638, Cl. 548-546.000.
Merck Frosst Canada, Inc.: *See*—
Young, Robert N.; Rokach, Joshua; and Hayes, Edward C., 4,954,638, Cl. 548-546.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Prucher, Helmut, 4,954,499, Cl. 514-247.000.
Merianos, John J.; and Garelick, Paul, to GAF Chemicals Corporation. Antimicrobial polymeric bisbiguanides. 4,954,636, Cl. 548-519.000.
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Fullemann, James S., 4,954,149, Cl. 55-386.000.
Merlone, John C. Metal spinning process and apparatus and product made thereby. 4,953,376, Cl. 72-57.000.
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Johnston, J. O'Neal, 4,954,488, Cl. 514-177.000.
Johnston, J. O'Neal; and Holbert, Gene W., 4,954,491, Cl. 514-174.000.
Mao, Simon J. T.; and Jackson, Richard L., 4,954,528, Cl. 514-712.000.
Mertens, Alfred; von der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, to Boehringer Mannheim GmbH. Tricyclic benzimidazole compounds, pharmaceutical compositions and methods of use. 4,954,498, Cl. 514-254.000.
Merz, Russell J.: *See*—
Wierenga, Thomas J.; Ladd, Joseph M., Jr.; Merz, Russell J.; and Nicholson, Alyce E., 4,954,285, Cl. 252-174.110.
Mesa Diagnostics, Inc.: *See*—
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Messerschmitt-Boelkow-Blohm GmbH: *See*—
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Messina, Giuseppe; Nurra, Carmelo; Cappellazzo, Oscar; Virdis, Angelo; and Lorenzoni, Loreno, to Enichem Anic S.p.A. Process for the direct hydration of linear olefins. 4,954,660, Cl. 568-697.000.
Mesur-Matic Electronics Corp.: *See*—
Newell, Harold R., 4,953,439, Cl. 84-655.000.
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Mennuto, Anthony R., 4,953,258, Cl. 16-197.000.
Metaleurop S.A.: *See*—
DeMarthe, Jean-Michel, 4,954,322, Cl. 423-95.000.
Metcalf, Brian W.: *See*—
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., 4,954,446, Cl. 435-184.000.
Metec, Inc.: *See*—
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Meyer, Harold D.: *See*—
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Meyers, Kenneth A., to Gerber Products Company. Self-righting vessel. 4,953,737, Cl. 250-70.000.
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Brahmbhatt, Sudhir R., 4,954,315, Cl. 422-31.000.
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Micro Fast Controls, Inc.: *See*—
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Nelson, Richard D.; and Herrell, Dennis J., 4,953,634, Cl. 165-147.000.
Redfield Stephen R.; and Hesselink, Lambertus, 4,953,924, Cl. 350-3.640.
Micromax S.p.A.: *See*—
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Mihara, Hirokata: *See*—
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Mihich, Alexander, to Hughes Aircraft Company. Optical slip ring. 4,953,932, Cl. 350-96.150.
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Mikuni Jukogyo Co., Ltd.: *See*—
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Miles Inc.: *See*—
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Miller, Alan K. Aviator's night vision system. 4,953,963, Cl. 350-547.000.
Miller Edge, Inc.: *See*—
Miller, Norman K., 4,954,673, Cl. 200-61.430.
Miller, Jeffrey T.; and Shum, Victor K., to Amoco Corporation. Catalyst and process for high selectivity reforming with Pt/Re on Ba-K-L zeolite. 4,954,245, Cl. 208-138.000.
Miller, Keith R.: *See*—
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Miller, Norman K., to Miller Edge, Inc. Highly sensitive switch for actuation of a device upon force being applied thereto. 4,954,673, Cl. 200-61.430.
Miller, Robert J.: *See*—
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Miller, Ronald B.: *See*—
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Miller, Steven D.; McDonald, Joseph C.; Eichner, Fred N.; and Tomeraasen, Paul L., to Battelle Memorial Institute. System for use with solid state dosimeter. 4,954,707, Cl. 250-337.000.
Miller, William A., to Fluid Management Limited Partnership. Mixing structure for paint colorant in a dispensing apparatus. 4,953,985, Cl. 366-244.000.
Miller, William W.: *See*—
Yafuso, Masao; Yan, Cheng F.; Hacker, Thomas G.; Hui, Henry K.; Maxwell, Thomas P.; and Miller, William W., 4,954,318, Cl. 422-59.000.
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Gilpatrick, Michael W., 4,953,270, Cl. 28-163.000.
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Milprint, Inc.: *See*—
Kappes, Kenneth C., 4,954,356, Cl. 426-107.000.
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, to Hitachi, Ltd. Thin film transistor formed on insulating substrate. 4,954,855, Cl. 357-23.700.
Minamisawa, Hiroshi: *See*—
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.
Minnesota Mining and Manufacturing Company: *See*—
Dennison, Richard L., 4,953,755, Cl. 222-146.500.
Dunshee, Wayne K., 4,953,550, Cl. 128-403.000.
Hansen, Paul E.; Insley, Thomas I.; and Libbey, Christopher J., 4,953,544, Cl. 128-156.000.
Hollingsworth, Elmont E.; and Schlaeger, Gary W., 4,954,098, Cl. 439-404.000.
Wood, Thomas E.; and Wilson, David M., 4,954,462, Cl. 501-95.000.
Wright, Bradford B.; and DeVoe, Robert J., 4,954,416, Cl. 430-281.000.
Yafuso, Masao; Yan, Cheng F.; Hacker, Thomas G.; Hui, Henry K.; Maxwell, Thomas P.; and Miller, William W., 4,954,318, Cl. 422-59.000.
Minney, Stephen C.: *See*—
Harmony, Daniel C.; Gummere, John B.; and Minney, Stephen C., 4,954,678, Cl. 219-10.430.
Mino, Testuya: *See*—
Nakamura, Yoshihiro; Takahashi, Kazuya; Ichinose, Atsuki; and Mino, Testuya, 4,954,906, Cl. 360-77.080.
Mino Yogyo Co., Ltd.: *See*—
Tanemura, Fumikazu; Honda, Tohru; Ohta, Shigetoshi; Kajita, Yoshiharu; and Kachi, Tatsushi, 4,954,460, Cl. 501-80.000.

Minohara, Taketoshi; Takagi, Yoshio; Isobe, Tadashi; and Suzuki, Keita, to Toyota Jidosha Kabushiki Kaisha. Pigment. 4,954,176, Cl. 106-417.000.

Minohara, Taketoshi: *See*—
Ito, Hiroshi; Handa, Junichi; Takagi, Yoshio; and Minohara, Taketoshi, 4,954,175, Cl. 106-417.000.

Minolta Camera Kabushiki Kaisha: *See*—
Oka, Tateki; Toyoshi, Naoki; and Toda, Kunio, 4,954,843, Cl. 355-210.000.
Yamaguchi, Ikunori; Emori, Kiyoshi; and Morikawa, Takashi, 4,954,968, Cl. 364-519.000.

Misawa, Yutaka: *See*—
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, 4,954,855, Cl. 357-23.700.

Misenar, Scott L.: *See*—
Jorgensen, Robert W.; Young, Vance W., Jr.; and Misenar, Scott L., 4,953,898, Cl. 285-340.000.

Misono, Shigemi: *See*—
Lee, Sungmuk; and Misono, Shigemi, 4,954,862, Cl. 355-1.000.

Mitu, Koichiro; Wadaka, Shusou; and Nagatsuka, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Filter bank. 4,954,793, Cl. 333-133.000.

Mita Industrial Co., Ltd.: *See*—
Harada, Hiroyuki; and Kajitani, Tetsuji, 4,954,863, Cl. 355-51.000.
Nishibayashi, Katsumi; and Teshima, Takashi, 4,954,411, Cl. 430-111.000.

Mitamura, Jouji: *See*—
Nakamura, Sigemi; Kurokawa, Hideo; and Mitamura, Jouji, 4,954,341, Cl. 424-70.000.

Mitani, Hiroshi: *See*—
Wakabashi, Noriaki; Yoshida, Shuichi; Inaji, Toshio; Onodera, Hiromi; Yoshiura, Tsukasa; and Mitani, Hiroshi, 4,954,905, Cl. 360-77.030.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Asai, Kohtaro; Murakami, Tokumichi; and Matsuzaki, Kazuhiro, 4,954,892, Cl. 358-133.000.
Funakoshi, Haruo, 4,954,772, Cl. 324-158.00R.
Hashizume, Atsushi, 4,953,520, Cl. 123-631.000.
Iguchi, Kazuyoshi; Tashima, Masatoshi; Tazi, Ryoichi; Yoshino, Soichi; and Yagi, Motoo, 4,954,734, Cl. 310-71.000.
Isozumi, Shuzoo, 4,954,733, Cl. 310-71.000.
Ito, Hiroshi; Kasezawa, Tadashi; and Yao, Masaharu, 4,954,885, Cl. 358-31.000.
Kumanoya, Masaki; Shinohara, Hirofumi; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Yamasaki, Hiroyuki, 4,954,992, Cl. 365-207.000.
Misu, Koichiro; Wadaka, Shusou; and Nagatsuka, Tsutomu, 4,954,793, Cl. 333-133.000.
Muta, Yoshifumi; and Fujii, Kozaburo, 4,954,056, Cl. 418-55.300.
Nakatsu, Keiji; and Ogawa, Masaharu, 4,955,009, Cl. 369-32.000.
Sako, Yuji, 4,954,668, Cl. 200-314.000.
Satou, Hiroshi; Utsui, Yoshihiko; Tuneyoshi, Kiyotugu; Taniguchi, Takashi; Haraga, Kousuke; and Tsukui, Keitarou, 4,954,215, Cl. 156-630.000.
Sengoku, Masaharu, 4,954,908, Cl. 360-78.040.
Sengoku, Masaharu, 4,954,909, Cl. 360-78.040.
Shindo, Koji; and Tsuchihashi, Masaru, 4,954,065, Cl. 425-175.000.
Tanimizu, Akihiro, 4,954,880, Cl. 358-17.000.
Terane, Hideyuki; and Nakagawa, Shinichi, 4,954,978, Cl. 364-715.100.
Uchikawa, Fusaoki; and Nomura, Kenji, 4,954,413, Cl. 430-135.000.
Ueno, Hirokazu; and Morikane, Hiroyuki, 4,953,414, Cl. 74-6.000.
Yoshida, Kazuomi; Higuchi, Hideyo; Mizuochi, Hitoshi; and Yamamoto, Yousuke, 4,954,853, Cl. 357-17.000.

Mitsubishi Jidosha Kogya Kabushiki Kaisha: *See*—
Oikawa, Hiroshi; Nakashima, Naohisa; Matsuhisa, Tadaaki; and Ozawa, Tadao, 4,953,528, Cl. 123-276.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Sakurai, Hiromi, 4,953,288, Cl. 29-704.000.

Mitsubishi Jukogyo K. K.: *See*—
Kimura, Yutaka; Okumura, Hiroshi; Mihara, Hirokata; and Yoshida, Mitsutoshi, 4,954,761, Cl. 318-568.100.

Mitsubishi Jukogyo K.K.: *See*—
Yoshida, Mitsutoshi; Tsubota, Toshio; and Okumura, Hiroshi, 4,954,043, Cl. 414-719.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Agawa, Jiro, 4,954,205, Cl. 156-502.000.

Mitsubishi Kasei Corporation: *See*—
Maeda, Shuichi; Kaneko, Toshio; Kurose, Yutaka; Kimura, Michiyo; Yoshida, Hidemi; Uchino, Kenichi; and Inaba, Shizue, 4,954,420, Cl. 430-270.000.
Taguchi, Nobuyoshi; Imai, Akihiro; Murata, Yukichi; and Hirota, Takao, 4,954,478, Cl. 503-227.000.

Mitsubishi Metal Corporation: *See*—
Tsujimura, Osamu; Arai, Tatsuo; and Saito, Takayoshi, 4,954,021, Cl. 407-35.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Ito, Akira; and Okada, Mizuo, 4,953,948, Cl. 350-128.000.
Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, 4,954,575, Cl. 525-330.500.

Mitsubishi Kasei Corporation: *See*—
Masaoka, Kazuhiko; and Kasori, Yukio, 4,954,621, Cl. 536-119.000.

Mitsuhashi, Kenhachi; and Suga, Shigeru, to Suga Test Instruments Co., Ltd.; and Yokohama Rubber Co., Ltd., The. Ventilation regulated hot air supplied constant temperature oven. 4,954,693, Cl. 219-400.000.

Mitsui Kensetsu Kabushiki Kaisha: *See*—
Noji, Toshiyuki; Yoshida, Hidetoshi; Tatsumi, Eiji; Akao, Shinichi; and Kosaka, Hideyuki, 4,953,330, Cl. 52-167.0DF.

Mitsui Petrochemical Industries, Ltd.: *See*—
Takata, Toshimasa; and Mizuno, Kenichi, 4,954,603, Cl. 528-98.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Iimuro, Shigeru; Morimoto, Yoshio; and Kitamura, Takashi, 4,954,661, Cl. 568-727.000.
Iwamoto, Mune; Ito, Norifumi; Sugazaki: Kazuo; Matsubara, Tetsuyuki; and Ando, Toshihiko, 4,954,571, Cl. 525-205.000.
Takuma, Keisuke; Ohyama, Tsukasa; Ghoda, Isamu; Mikoda, Tamio; Koshida, Hitoshi; and Igata, Akitoshi, 4,954,410, Cl. 430-109.000.

Miura, Yasuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Package semiconductor device using chalcogenide glass sealing. 4,954,874, Cl. 357-74.000.

Miyachi, Takumi: *See*—
Ono, Hisao; Sato, Ryuji; and Miyachi, Takumi, 4,954,125, Cl. 526-138.000.

Miyajima, Hiromu: *See*—
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.

Miyake, Norihisa; Sumita, Masaki; and Sarugaku, Shinichi, to Hitachi, Ltd; and Hitachi Keiyo Engineering Co., Ltd. Method and apparatus for controlling tracking path of working point of industrial robot. 4,954,762, Cl. 318-568.190.

Miyake, Shingo: *See*—
Komori, Teruyuki; Miyake, Shingo; and Senoo, Yoshio, 4,954,536, Cl. 523-149.000.

Miyamoto, Mitsuaki: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.

Miyamoto, Tsutomu; Igarashi, Hisanaga; and Hidenori, Sugiyama, to Eisai Co., Ltd. Preventing agent for human immunodeficiency virus infection comprising menfegol. 4,954,530, Cl. 514-718.000.

Miyata, Kenji: *See*—
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, 4,954,855, Cl. 357-23.700.

Miyata, Shigeo: *See*—
Iwasami, Teruo; Miyata, Shigeo; and Moriyama, Takamasa, 4,954,557, Cl. 524-399.000.

Miyauchi, Yasushi: *See*—
Nishida, Tetsuya; Terao, Motoyasu; Miyauchi, Yasushi; and Horigome, Shinkichi, 4,954,379, Cl. 428-64.000.

Miyazaki, Katsumi: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.

Miyazaki, Kunihiro: *See*—
Takiyama, Masahiro; Miyazaki, Kunihiro; and Shiozawa, Kenichiro, 4,954,141, Cl. 51-296.000.

Miyazaki, Masaru: *See*—
Imoto, Katsuyuki; Sano, Hirohisa; Miyazaki, Masaru; Matsuoka, Naoyuki; and Uetsuka, Hisato, 4,953,934, Cl. 350-96.150.

Miyazaki, Yasumitsu; Enomoto, Ryo; and Yamada, Masaya, to Ibiden Co., Ltd. Second harmonic wave generating device. 4,953,931, Cl. 350-96.120.

Miyazaki, Yasumitsu; Enomoto, Ryo; and Yamada, Masaya, to Ibiden Co., Ltd. Second harmonic wave generating device. 4,953,943, Cl. 350-96.120.

Miyazawa, Takeshige; and Kawano, Kazuhiko, to Kumiai Chemical Industry Co., Ltd. Plant growth regulating composition and method for regulating growth of a plant. 4,954,157, Cl. 71-86.000.

Miyoshi, Tsuyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Overload preventing system for kneading machine. 4,953,984, Cl. 366-76.000.

Mizuhara, Noboru; Tohru, Hoshi; and Morita, Takashi, to Hitachi, Ltd. Multimedia information exchanging system and equipment therefor. 4,955,019, Cl. 370-85.700.

Mizui, Takuji: *See*—
Kita, Toru; Narumiya, Shuh; Narisada, Masayuki; Watanabe, Fumrhio; Doteuchi, Masami; and Mizui, Takuji, 4,954,514, Cl. 514-381.000.

Mizukami, Toru: *See*—
Katsumata, Ryoichi; Mizukami, Toru; and Oka, Tetsuo, 4,954,441, Cl. 435-115.000.

Mizuno, Kenichi: *See*—
Takata, Toshimasa; and Mizuno, Kenichi, 4,954,603, Cl. 528-98.000.

Mizunoya, Nobuyuki; Komorita, Hiroshi; Tanaka, Tadashi; and Matsumura, Kazuo, to Kabushiki Kaisha Toshiba. Joined ceramic-metal composite substrate and method for production thereof. 4,954,386, Cl. 428-137.000.

Mizuochi, Hitoshi: *See*—
Yoshida, Kazuomi; Higuchi, Hideyo; Mizuochi, Hitoshi; and Yamamoto, Yousuke, 4,954,853, Cl. 357-17.000.

Mizutani, Yoshihisa; and Kimura, Minoru. Semiconductor device with composite electrode. 4,954,871, Cl. 357-67.000.

Mobay Corporation: *See*—
Anderson, Howard A., 4,953,340, Cl. 52-684.000.
Jackman, Dennis E.; and Morgan, John G., 4,954,627, Cl. 544-182.000.
Rains, Randall C.; Dormish, Jeffrey F.; Stanton, Susan A.; and Rieck, James N., 4,954,199, Cl. 156-331.700.
Sanns, Frank, Jr., 4,954,537, Cl. 521-157.000.
Mobil Oil Corporation: *See*—
Koda, Walter, 4,953,740, Cl. 220-263.000.
Kuehl, Guenter H.; and Rosinski, Edward J., 4,954,243, Cl. 208-120.000.
Marler, David O.; and McWilliams, John P., 4,954,663, Cl. 568-791.000.
Nowlin, Thomas E.; and Schurzky, Kenneth G., 4,954,470, Cl. 502-107.000.
Rubin, Mae K.; and Chu, Pochen, 4,954,325, Cl. 423-328.000.
Mochida, Mitsuyoshi; Maekawa, Tokuo; Takei, Hisashi; Matsumoto, Yasuo; Ohmura, Hiroshi; Sugimoto, Shigeru; Ushiro, Seimei; Asano, Seiji; and Yoshida, Toshio, to Fuji Photo Film Co., Ltd. Photographic film package and method of making the same. 4,954,857, Cl. 354-75.000.
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; Ogawa, Taro; and Kimura, Takeshi, to Hitachi, Ltd. Pattern fabrication by radiation-induced graft copolymerization. 4,954,424, Cl. 430-323.000.
Mochizuki, Masataka: *See*—
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 4,953,632, Cl. 165-104.260.
Modic, Frank J.; and Striker, Richard A., to General Electric Company. Low viscosity silicone foam compositions. 4,954,533, Cl. 521-82.000.
Modum Stiger a.s.: *See*—
Lia, Peder, 4,953,505, Cl. 119-57.200.
Moehling, Charles: *See*—
Wronkiewicz, Robert D.; and Moehling, Charles, 4,953,471, Cl. 105-198.400.
Moerker, Theophile: *See*—
Heinrich, Peter; and Moerker, Theophile, 4,954,634, Cl. 548-341.000.
Mohn, Frank, to Framo Developments (UK) Limited. Electrical conductor arrangements for pipe system. 4,953,636, Cl. 166-65.100.
Mohr, Friedemann: *See*—
Kuppers, Dieter; Herse, Klaus; Hiepe-Wohlleben, Kate; Kaiser, Manfred; Mohr, Friedemann; and Ohnsorge, Horst, 4,955,014, Cl. 370-3.000.
Mohri, Akira; and Kato, Toshikazu, to Murata Manufacturing Co., Ltd. Tape structure provided with electronic components. 4,953,699, Cl. 206-330.000.
Mokvist, Anders V.: *See*—
Reinhall, Rolf B.; Johansson, Johan G. I.; and Mokvist, Anders V., 4,954,221, Cl. 162-261.000.
Molins plc: *See*—
Cahill, Michael J.; and Dawson, John, 4,953,573, Cl. 131-280.000.
Monarch Marking Systems, Inc.: *See*—
Benge, S. Eugene, 4,954,814, Cl. 340-572.000.
Hamisch, Paul H., Jr.; and Makley, James A., 4,954,208, Cl. 156-577.000.
Monell Chemical Senses Center: *See*—
Friedman, Mark I.; Tordoff, Michael G.; DiNovi, Michael J.; and Rafka, Robert J., 4,954,531, Cl. 514-738.000.
Monji, Hideto: *See*—
Aoki, Masaki; Torii, Hideo; Kuribayashi, Kiyoshi; Monji, Hideto; Umetani, Makoto; and Fujii, Eiji, 4,953,385, Cl. 72-462.000.
Monsanto Company: *See*—
Weisenfeld, Robert B., 4,954,466, Cl. 502-24.000.
Monsorno, Richard V.: *See*—
Insetta, Victor D.; Monsorno, Richard V.; and Dorrian, John F., 4,953,273, Cl. 29-25.420.
Monte, William T.: *See*—
Kleschik, William A.; Ehr, Robert J.; Costales, Mark J.; Gerwick, Ben C., III; Meikle, Richard W., deceased; Monte, William T.; and Pearson, Norman R., 4,954,163, Cl. 71-92.000.
Montgomery, Darryl R.; and Raber, David C. Transverse-mounted slurry sealant box assembly. 4,954,010, Cl. 404-96.000.
Monty, Lawrence P.: *See*—
Uke, Alan K.; and Monty, Lawrence P., 4,953,862, Cl. 273-75.000.
Mooney, Robery C.; and Peirent, Richard J., to Wang Laboratories, Inc. Terminal with viewports, auxiliary device attachment, and host-terminal flan control. 4,954,966, Cl. 364-518.000.
Moore, Eugene R.; and Wessel, Tom E., to Dow Chemical Company, The. Apparatus and process for devolatilization of high viscosity polymers. 4,954,303, Cl. 264-101.000.
Moore, John R.: *See*—
Nieman, Gerald R.; Clyatt, Clarence L., III; Paulus, Eric J.; Zehrung, Scott A.; Ragl, Albert; and Moore, John R., 4,954,794, Cl. 333-182.000.
Moore, Robert R.: *See*—
Birmingham, Joseph G.; and Moore, Robert R., 4,954,320, Cl. 422-186.040.
Moore, T. Charles: *See*—
Borden, Louis H.; and Moore, T. Charles, 4,953,616, Cl. 166-66.400.
Moorman Manufacturing Company: *See*—
Taylor, Ian A., 4,953,504, Cl. 119-54.000.
Moos, Wolfgang: *See*—
Rothenpieler, Manfred; and Moos, Wolfgang, 4,953,806, Cl. 242-72.100.
Morales, Victor H., to Windfred M. Berg, Inc. Anti-backlash nut. 4,954,032, Cl. 411-289.000.
Mordhorst, Hans-Jurgen: *See*—
Weckenmann, Albert; and Mordhorst, Hans-Jurgen, 4,953,306, Cl. 33-503.000.
Moreau, Pierre A., to BCM Manufacturing Ltd. Flooring unit. 4,953,501, Cl. 119-28.000.
Morflex Chemical Company, Inc.: *See*—
Hull, Ezekiel H.; and Frappier, Edward P., 4,954,649, Cl. 560-180.000.
Morgan, John G.: *See*—
Jackman, Dennis E.; and Morgan, John G., 4,954,627, Cl. 544-182.000.
Morganstein, Sanford J.; Bindl, Ron H.; Klecka, Mark D.; Krakau, Herbert B.; and Dawson, Thomas M., to Dytel Corporation. Automated attendant with direct inward system access. 4,955,047, Cl. 379-112.000.
Mori, Hiroshi. Process for manufacturing alloy wheels for vehicle tires. 4,953,275, Cl. 29-894.324.
Mori, Kei. Light radiator. 4,953,549, Cl. 128-398.000.
Mori, Takahiro: *See*—
Hasegawa, Kenji; Mori, Takahiro; and Higuma, Masahiko, 4,954,395, Cl. 428-318.400.
Mori, Toshihiro: *See*—
Umetsu, Shinjiro; and Mori, Toshihiro, 4,955,084, Cl. 455-278.000.
Morikane, Hiroyuki: *See*—
Ueno, Hirokazu; and Morikane, Hiroyuki, 4,953,414, Cl. 74-6.000.
Morikawa, Minoru: *See*—
Iwata, Masayosi; Muto, Toahiya; Morikawa, Minoru; Kozawa, Satoshi; Takase, Akihiko; and Terano, Naoki, 4,954,675, Cl. 200-317.000.
Morikawa, Takashi: *See*—
Yamaguchi, Ikunori; Emori, Kiyoshi; and Morikawa, Takashi, 4,954,968, Cl. 364-519.000.
Morimoto, Akira, to Asahi Kogaku Kogyo Kabushiki Kaisha. Scanning optical system for use in laser beam printer. 4,953,926, Cl. 350-6.800.
Morimoto, Yoshio: *See*—
Iimuro, Shigeru; Morimoto, Yoshio; and Kitamura, Takashi, 4,954,661, Cl. 568-727.000.
Morin, Roger: *See*—
Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, 4,954,711, Cl. 250-423.00R.
Morinaga, Takashi: *See*—
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.
Morita, Kouichi: *See*—
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,954,626, Cl. 544-105.000.
Morita, Kuniki: *See*—
Matsumoto, Yukio; Saito, Horiyuki; and Morita, Kuniki, 4,953,835, Cl. 267-180.000.
Morita, Shizuo; Matsumoto, Toru; Kamegamori, Masayuki; Hayakawa, Kazushi; Hatakeyama, Noboru; Matsuo, Shunji; and Fukuchi, Masakazu, to Konica Corporation. Multicolor image developing device. 4,954,844, Cl. 355-260.000.
Morita, Takashi: *See*—
Mizuhara, Noboru; Tohru, Hoshi; and Morita, Takashi, 4,955,019, Cl. 370-85.700.
Moritani, Toshifumi: *See*—
Azeta, Takahiro; Kameyama, Toru; Sekiya, Harukazu; Moritani, Toshifumi; Higeta, Akira; Baba, Kenji; Matoba, Takeshi; Goto, Shinji; and Kubota, Kazuyuki, 4,953,846, Cl. 271-251.000.
Moriyama, Takamasa: *See*—
Iwanami, Teruo; Miyata, Shigeo; and Moriyama, Takamasa, 4,954,557, Cl. 524-399.000.
Mornex Limited: *See*—
Elmaleh, Samuel; and Grasmick, Alain, 4,954,259, Cl. 210-617.000.
Moroto, Shuzo; Kawai, Masao; Yokoyama, Shoji; Kobayashi, Koji; and Sumiya, Koji, to Aisin A W Co. Ltd.; and Kabushiki Kaisha Shinsangyokaihatsu. Navigation system. 4,954,959, Cl. 364-449.000.
Moroz, Chaya. Isoferritin as a marker for pathological pregnancy. 4,954,434, Cl. 435-7.000.
Morrow, William K.: *See*—
Raible, Donald A.; and Morrow, William K., 4,954,055, Cl. 417-477.000.
Morsdorf, Peter: *See*—
Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 4,954,501, Cl. 514-252.000.
Morton, Mary E.: *See*—
Froehner, Stanley C.; and Morton, Mary E., 4,954,436, Cl. 435-7.000.
Morton, Nancy A.: *See*—
Jao, Tze C.; Morton, Nancy A.; and Erickson, Robert W., Jr., 4,954,272, Cl. 252-25.000.
Moscrip, William M., to United States of America, Navy. Liquid monopropellant gun. 4,953,440, Cl. 89-7.000.
Mosher, David: *See*—
Wood, Charles H.; and Mosher, David, 4,954,756, Cl. 315-39.000.
Moshier, David R. Brassiere strap retainer. 4,953,233, Cl. 2-268.000.
Mosteller, Peter. Chain link fence hanger. 4,953,817, Cl. 248-222.200.
Motohashi, Ryo: *See*—
Kawamoto, Tetsuo; Motohashi, Ryo; Sakamoto, Toshihiro; Suzuki, Yasuo; and Abe, Hideaki, 4,954,736, Cl. 316-156.000.

Motomatsu, Keiko: *See—*
Kobayashi, Toshiaki; and Motomatsu, Keiko, 4,954,291, Cl. 252-315.100.
Motorola, Inc.: *See—*
Anderson, George C., 4,955,075, Cl. 455-182.000.
Green, Steven R.; De Muro, David M.; Moutrie, Michael F.; Sokola, Raymond L.; and Gordon, Phillip J., 4,954,796, Cl. 333-206.000.
Hira, Gerald M.; Sheahen, Dana M.; Wilson, Pamela L.; and Nolan, Michael P., 4,954,948, Cl. 364-200.000.
Jao, Tze C.; Morton, Nancy A.; and Erickson, Robert W., Jr., 4,954,272, Cl. 252-25.000.
Mech, Harold W., 4,955,059, Cl. 381-116.000.
Phillips, Sharon E. T.; and Eastmond, Bruce C., 4,955,083, Cl. 455-47.000.
Wong, Soon F.; Leong, Chee S.; and Ng, Cher Y., 4,955,071, Cl. 455-90.000.
Motoyama Eng. Works, Ltd.: *See—*
Ohmi, Tadahiro; Kanno, Yohichi; Satoh, Kazuhiko; and Hatayama, Tadahiro, 4,953,826, Cl. 251-331.000.
Motyka, Linda A.: *See—*
Dagger, Raymond E.; and Motyka, Linda A., 4,954,632, Cl. 546-194.000.
Motz, Karl; and Diehl, Markus, to Man Technologie GmbH. Combustion control. 4,953,351, Cl. 60-285.000.
Moulin, Norbert L., to Hughes Aircraft Company. Multi-channel hermaphroditic lens type fiber optic connector. 4,953,944, Cl. 350-96.210.
Moulton, Herbert F. Inert gas lighting system and means therefor. 4,953,314, Cl. 40-545.000.
Mounger, Robert W.: *See—*
Lee, Robert D.; Mounger, Robert W.; and Heptig, John P., 4,955,038, Cl. 375-35.000.
Moutrie, Michael F.: *See—*
Green, Steven R.; De Muro, David M.; Moutrie, Michael F.; Sokola, Raymond L.; and Gordon, Phillip J., 4,954,796, Cl. 333-206.000.
Mozer, Albrecht, to Alcatel N.V. Semiconductor arrangement for producing a periodic refractive index distribution and/or a periodic gain distribution. 4,955,036, Cl. 372-96.000.
MTU Motoren- und Turbinen-Union Munchen GmbH: *See—*
Jabs, Alfred, 4,953,290, Cl. 29-890.043.
Sikorski, Seigfried, 4,954,387, Cl. 428-138.000.
Mueller Co.: *See—*
Sands, Robert E., 4,953,588, Cl. 137-512.300.
Mueller, Karl F., to Ciba-Geigy Corporation. Dimethylacrylamide-copolymer hydrogels with high oxygen permeability. 4,954,587, Cl. 526-245.000.
Mueller, Louis H. Prefilled catheter tip syringe kit. 4,954,239, Cl. 206-571.000.
Muhammad, Annie. Learning game. 4,953,869, Cl. 273-236.000.
Mukoyama, Yoshiyuki: *See—*
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.
Mukoyoshi, Shunichiro: *See—*
Shuku, Shigekazu; Mukoyoshi, Shunichiro; Yuasa, Eiji; and Yamori, Tsunefumi, 4,954,47/, Cl. 503-226.000.
Muller, Arno: *See—*
Riley, Gilbert N.; Holodnak, Richard S.; Malin, Richard A.; and Muller, Arno, 4,953,996, Cl. 400-162.200.
Muller, Eberhard: *See—*
Obrecht, Werner; Wendling, Peter; Musch, Rudiger; and Muller, Eberhard, 4,954,585, Cl. 526-220.000.
Muller, Gunther: *See—*
Aigner, Rudolf; Muller, Gunther; Muller, Rainer; and Reuner, Horst, 4,954,646, Cl. 558-31.000.
Muller, Heinz K., to Busak & Luyken GmbH & Co. Sealing ring structure. 4,953,876, Cl. 277-165.000.
Muller, Josef, to Rohm Pharma GmbH. Dermally acting pharmaceutical preparation with liposomes as vehicle means. 4,954,345, Cl. 424-450.000.
Muller, Rainer: *See—*
Aigner, Rudolf; Muller, Gunther; Muller, Rainer; and Reuner, Horst, 4,954,646, Cl. 558-31.000.
Muller, Roger; and Bee, Giancarlo, to S.F. Muller & Partner. Filtering apparatus with pleated filtering material. 4,954,255, Cl. 210-437.000.
Multi-Technology Inc.: *See—*
Jessop, Paul M.; and Jeffs, David H., 4,953,741, Cl. 220-273.000.
Munach, Arnold S.; and Nguyen, John Q., to United States of America, Navy. Safety-arming system for launched projectiles. 4,953,475, Cl. 102-229.000.
Munemura, Masahiro; and Takahashi, Kenji, to Fuji Jukogyo Kabushiki Kaisha. Structure of a blind panel window for an automobile. 4,953,912, Cl. 296-191.000.
Murai, Makoto: *See—*
Wagai, Kiyoshi; and Murai, Makoto, 4,955,080, Cl. 455-343.000.
Murai, Takeshi: *See—*
Ohmura, Hiroshi; Nakashima, Takashi; and Murai, Takeshi, 4,953,652, Cl. 180-140.000.
Murakami, Eiji: *See—*
Sano, Yasuro; Orii, Akira; and Murakami, Eiji, 4,953,486, Cl. 112-447.000.
Murakami, Kunichika: *See—*
Yoshioka, Hidetoshi; Kojima, Eiji; Ishida, Shuji; Yoshioka, Hiroyuki; and Murakami, Kunichika, 4,954,485, Cl. 514-49.000.
Murakami, Mutsuaki; Nishiki, Naomi; Yoshimura, Susumu; and Watanabe, Kazuhiro, to Matsushita Electric Industrial Co., Ltd.; and Research Development Corporation of Japan. Method for making a graphite film or sheet. 4,954,193, Cl. 156-155.000.
Murakami, Satoshi: *See—*
Iwamura, Soichi; Murakami, Satoshi; and Itsumi, Tadashi, 4,955,048, Cl. 379-53.000.
Murakami, Tokumichi: *See—*
Asai, Kohtaro; Murakami, Tokumichi; and Matsuzaki, Kazuhiro, 4,954,892, Cl. 358-133.000.
Muramatsu, Yukio: *See—*
Ozaki, Keiichi; Manabe, Naoki; Shibata, Tatsumi; Hayashi, Hideharu; Muramatsu, Yukio; and Yamamoto, Masaki, 4,954,102, Cl. 439-535.000.
Murata Hatsujo Co. Ltd.: *See—*
Matsumoto, Yukio; Saito, Horiyuki; and Morita, Kuniki, 4,953,835, Cl. 267-180.000.
Murata, Kazushige; and Nagoshi, Mitsuru, to Konica Corporation. Recirculating automatic document feeder. 4,954,847, Cl. 355-318.000.
Murata Kikai Kabushiki Kaisha: *See—*
Tone, Shoichi; and Kiriake, Masaharu, 4,953,798, Cl. 242-35.50R.
Murata Manufacturing Co., Ltd.: *See—*
Higuchi, Hirokazu; and Hamuro, Mitsuro, 4,954,207, Cl. 156-552.000.
Kawabata, Shoichi; Tsuge, Hisanao; and Wakatsuki, Hiromichi, 4,953,283, Cl. 29-593.000.
Mohri, Akira; and Kato, Toshikazu, 4,953,699, Cl. 206-330.000.
Shikama, Takashi; Wakabayashi, Asami; and Torii, Kiyofumi, 4,954,692, Cl. 219-365.000.
Tabota, Jun, 4,953,410, Cl. 73-862.040.
Murata, Yukichi: *See—*
Taguchi, Nobuyoshi; Imai, Akihiro; Murata, Yukichi, and Hirota, Takao, 4,954,478, Cl. 503-227.000.
Murdock, Michael: *See—*
Boyd, Ferrell W., Jr.; Murdock, Michael; McCormack, Michael; and Darbee, Paul, 4,955,054, Cl. 379-269.000.
Musch, Rudiger: *See—*
Obrecht, Werner; Wendling, Peter; Musch, Rudiger; and Muller, Eberhard, 4,954,585, Cl. 526-220.000.
Muse, Clarence W. Golf bag rain cover. 4,953,768, Cl. 224-205.000.
Muta, Yoshifumi; and Fujii, Kozaburo, to Mitsubishi Denki Kabushiki Kaisha. Scroll machine with pin coupling. 4,954,056, Cl. 418-55.300.
Muto, Toahiya: *See—*
Iwata, Masayosi; Muto, Toahiya; Morikawa, Minoru; Kozawa, Satoshi; Takase, Akihiko; and Terano, Naoki, 4,954,675, Cl. 200-317.000.
Muzyka, Douglas W.: *See—*
Marchildon, Ernest K. A.; Muzyka, Douglas W.; and Dumoulin, Michel M., 4,954,302, Cl. 264-40.100.
Mylari, Banavara L.; and Zembrowski, William J., to Pfizer Inc. Process and intermediates for the preparation of oxophthalazinyl acetic acids and analogs thereof. 4,954,629, Cl. 544-237.000.
Myoga, Maki: *See—*
Madsen, Lamar R.; and Myoga, Maki, 4,954,954, Cl. 364-413.290.
Nabeshima, Daiki; and Nakane, Hiroshi, to Kabushiki Kaisha Toshiba. Constant velocity track jump servo system for disc players. 4,955,010, Cl. 369-32.000.
NAC Engineering and Marketing, Inc.: *See—*
Nastrom, Harvey J., 4,955,000, Cl. 367-117.000.
Nadin, Leonard, to Labinal. Shunt connection device for electrical connectors. 4,954,093, Cl. 439-188.000.
Nagai, Takeshi; Fukuda, Hiroshi; Itoh, Masahiko; and Shitaya, Takao, to Matsushita Electric Industrial Co., Ltd. Cooking oven having function to automatically clean soils attached to inner walls thereof. 4,954,694, Cl. 219-413.000.
Nagaki, Hideyoshi: *See—*
Takano, Shuntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, 4,954,518, Cl. 514-456.000.
Nagano, Eiki: *See—*
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,954,626, Cl. 544-105.000.
Nagano, Masami; and Atago, Takeshi, to Hitachi, Ltd. Ignition timing control unit for internal combustion engine. 4,953,532, Cl. 123-419.000.
Nagaoka, Shinji; Kawai, Michio; and Sato, Koji, to Seikosha Co., Ltd. Method of driving multiple flash rangefinder. 4,954,861, Cl. 354-403.000.
Nagarajan, Ramakrishnan, to Eli Lilly and Company. Recovery of difluoro sugar. 4,954,623, Cl. 536-127.000.
Nagasaka, Nobusuke: *See—*
Fukao, Hiroaki; Ohkita, Teruhiko; Nagasaka, Nobusuke; and Ueno, Tateo, 4,953,484, Cl. 112-162.000.
Nagatsuka, Tsutomu: *See—*
Misu, Koichiro; Wadaka, Shusou; and Nagatsuka, Tsutomu, 4,954,793, Cl. 333-133.000.
Nagoshi, Mitsuru: *See—*
Murata, Kazushige; and Nagoshi, Mitsuru, 4,954,847, Cl. 355-318.000.
Nagura, Masato: *See—*
Hara, Kazuhiko; Takahashi, Toshiaki; and Nagura, Masato, 4,953,405, Cl. 73-602.000.

Nagy, Lajos: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.

Nahill, Thomas E.: *See*—
Krishnakumar, Suppayan M.; Nahill, Thomas E.; Schmidt, Steven L.; and Collette, Wayne N., 4,954,376, Cl. 428-35.700.

Naito, Taketoshi: *See*—
Oguro, Katsunori; Nojima, Hiroshi; Hashizume, Nobuyuki; Ohno, Norio; and Naito, Taketoshi, 4,954,512, Cl. 514-352.000.

Naka, Michiro: *See*—
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Naka, Michiro, 4,954,540, Cl. 524-86.000.

Naka, Reishi: *See*—
Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.

Nakabayashi, Satoru: *See*—
Tsuroka, Takashi; Nakabayashi, Satoru; Matsuhashi, Yuji; Yamamoto, Haruo; Inouye, Shigeharu; and Kondo, Shinichi, 4,954,510, Cl. 514-315.000.

Nakagawa, Shinichi: *See*—
Terane, Hideyuki; and Nakagawa, Shinichi, 4,954,978, Cl. 364-715.100.

Nakagawa, Tadashi; Otora, Takahito; and Nemoto, Ichiro, to Seikosha Co., Ltd. Focal-plane shutter. 4,954,860. Cl. 354-246.000.

Nakamichi Corporation: *See*—
Noguchi, Yoshihiro, 4,953,807, Cl. 242-76.000.

Nakamoto, Kouji: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.

Nakamura, Hisashi, to Diesel Kiki Co., Ltd. Sealing device of delivery valve for fuel injection units. 4,953,589, Cl. 137-543.230.

Nakamura, Kazunari; Hagiwara, Toshihiko; and Takano, Akira, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,953,539, Cl. 128-6.000.

Nakamura, Sigemi; Kurokawa, Hideo; and Mitamura, Jouji, to Lion Corporation. Hair cosmetic composition. 4,954,341, Cl. 424-70.000.

Nakamura, Takashi; and Uchiyama, Kaoru, to Fuji Photo Film Co., Ltd. Photosensitive material processing apparatus. 4,954,838, Cl. 354-320.000.

Nakamura, Taku; Hirano, Tsumoru; Funatsu, Eiji; and Ishikawa, Shunichi, to Fuji Photo Film Co., Ltd. Light-sensitive microcapsule containing polymerizable compound and silver halide, and light-sensitive material employing the same. 4,954,417, Cl. 430-138.000.

Nakamura, Toru: *See*—
Yasunaga, Yoshitaka; and Nakamura, Toru, 4,954,698, Cl. 235-454.000.

Nakamura, Toshihide: *See*—
Tsurumi, Kazunori; Nakamura, Toshihide; and Sato, Akira, 4,954,474, Cl. 502-185.000.

Nakamura, Toshimasa: *See*—
Saeki, Yukihiro; and Nakamura, Toshimasa, 4,954,991, Cl. 365-189.010.

Nakamura, Yoshihiro; Takahashi, Kazuya; Ichinose, Atsuki; and Mino, Testuya, to Seiko Epson Corporation. Position control system for a magnetic storage device using a small sized disk. 4,954,906, Cl. 360-77.080.

Nakane, Hiroshi: *See*—
Nabeshima, Daiki; and Nakane, Hiroshi, 4,955,010, Cl. 369-32.000.

Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, to Hitachi, Ltd.; and Hitachi Microsoftware Systems, Inc. Multi-window display control system. 4,954,818, Cl. 340-721.000.

Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Naka, Michiro, to Polyplastics Co., Ltd. Halogen-contained polyester resin composite and electric wire. 4,954,540, Cl. 524-86.000.

Nakane, Toshio; Kageyama, Yukihiko; Konuma, Hiroaki; and Hijikata, Kenji, to Polyplastics Co., Ltd. Flame-retardant resin composition and electric wire. 4,954,541, Cl. 524-86.000.

Nakanishi, Keiichirou; Yamada, Minoru; Yamamoto, Masakazu; Ogihara, Satoru; Shinohara, Hiroichi; and Suzuki, Hideo, to Hitachi, Ltd. Chip carrier. 4,954,877, Cl. 357-80.000.

Nakanishi, Motoyasu, to Kabushiki Kaisha Sigel. Ball hitting sports tool. 4,953,861, Cl. 273-73.00J.

Nakano, Hideharu: *See*—
Tsuji, Eiji; and Nakano, Hideharu, 4,953,574, Cl. 132-232.000.

Nakao, Toshiyuki; and Adachi, Naomichi, to Aisin Seiki Kabushiki Kaisha. Differential gear apparatus with worm gears. 4,954,122, Cl. 475-160.000.

Nakashima, Naohisa: *See*—
Oikawa, Hiroshi; Nakashima, Naohisa; Matsuhisa, Tadaaki; and Ozawa, Tadao, 4,953,528, Cl. 123-276.000.

Nakashima, Takashi: *See*—
Ohmura, Hiroshi; Nakashima, Takashi; and Murai, Takeshi, 4,953,652, Cl. 180-140.000.

Nakasuji, Masaaki: *See*—
Nishimura, Akira; and Nakasuji, Masaaki, 4,953,945, Cl. 350-96.230.

Nakata, Kazuo: *See*—
Okumura, Takuzo; Okada, Toyokazu; Kikui, Hitoshi; and Nakata, Kazuo, 4,953,952, Cl. 350-337.000.

Nakata, Tetsuro, to Sony Corporation. Wipe pattern generator. 4,954,898, Cl. 358-182.000.

Nakatsu, Keiji; and Ogawa, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Optical disk drive apparatus having counter disable at seek start-up. 4,955,009, Cl. 369-32.000.

Nakayama, Hiroshi: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, 4,953,677, Cl. 192-3.300.

Nakayama, Yoshiaki; Saito, Kenji; and Kawada, Yukihiro, to Fuji Photo Film Co., Ltd. Method and apparatus for automatically adjusting white balance. 4,954,884, Cl. 358-29.000.

Nakazawa, Tadashi: *See*—
Sato, Yoshikazu; Watabe, Hiroomi; Ishii, Shigetaka; Nakazawa, Tadashi; Shomura, Takashi; Sezaki, Masaji; and Kondo, Shinichi, 4,954,641, Cl. 549-384.000.

Nalco Chemical Company: *See*—
Branning, Merle L., 4,954,547, Cl. 524-232.000.

Naoi, Takashi: *See*—
Ishigaki, Kunio; and Naoi, Takashi, 4,954,430, Cl. 430-534.000.

Narisada, Masayuki: *See*—
Kita, Toru; Narumiya, Shuh; Narisada, Masayuki; Watanabe, Fumrhio; Doteuchi, Masami; and Mizui, Takuji, 4,954,514, Cl. 514-381.000.

Narita, Kazuhisa: *See*—
Tatee, Tochiro; Takahira, Takashi; Yamashita, Kouwa; Sakurai, Masao; Shiozawa, Akira; and Narita, Kazuhisa, 4,954,642, Cl. 549-389.000.

Narumiya, Shuh: *See*—
Kita, Toru; Narumiya, Shuh; Narisada, Masayuki; Watanabe, Fumrhio; Doteuchi, Masami; and Mizui, Takuji, 4,954,514, Cl. 514-381.000.

Nastrom, Harvey J., to NAC Engineering and Marketing, Inc. Ultrasonic personnel location identification system. 4,955,000, Cl. 367-117.000.

NaTec Resources, Inc.: *See*—
Hooper, Richard G., 4,954,324, Cl. 423-239.000.

Nsthans, Robert L.: *See*—
Lovell, Walter C.; and Nathans, Robert L., 4,953,372, Cl. 70-89.000.

National Seating Company: *See*—
Smith, Rod; Oliphant, Timothy L.; and Stephens, Charles E., 4,954,051, Cl. 417-305.000.

Natusch, Paul J.; Yu, Eugene L.; Senerchia, David C.; and Henry, John F., Jr., deceased (by Henry, Beverly A., administratrix), to Digital Equipment Corporation. Apparatus and method for providing distribution control in a main memory unit of a data processing system. 4,954,946, Cl. 364-200.000.

Nauchno-Tekhnicheskoe Objedinenie Akademii Nauk SSSR: *See*—
Alexandrov, Maxim L.; Shevkunov, Vsevolod V.; and Pavlov, Alexandr J., 4,954,253, Cl. 210-198.200.

Nawamaki, Tsutomu: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Suzuki, Koichi, 4,954,165, Cl. 71-103.000.

NEC Corporation: *See*—
Fujisaki, Hisashi; and Shimada, Keiko, 4,955,055, Cl. 379-390.000.
Ikeda, Sadanobu, 4,954,944, Cl. 364-200.000.
Tanimoto, Kenzo, 4,955,023, Cl. 371-40.100.
Umetsu, Shinjiro; and Mori, Toshihiro, 4,955,084, Cl. 455-278.000.
Urai, Takahiko, 4,954,729, Cl. 307-443.000.
Yamada, Kazuhiko; and Maruyama, Takao, 4,954,920, Cl. 360-113.000.
Yamada, Tadaharu, 4,954,919, Cl. 360-104.000.
Yamaguchi, Masaya; and Suzuki, Takamasa, 4,954,993, Cl. 365-226.000.

NEC Home Electronics Ltd.: *See*—
Endo, Kunio; and Katsukawa, Tadashi, 4,954,889, Cl. 358-80.000.

Necam B.V.: *See*—
van der Weide, Jouke; and Hoogeboom, Adrianus J. T., 4,953,516, Cl. 123-527.000.

Negele, Michael: *See*—
Bielefeldt, Dietmar; Marhold, Albrecht; and Negele, Michael, 4,954,666, Cl. 570-132.000.

Negrini, Giovanni; and Chiola, Roberto. Flipper for flipper swimming. 4,954,112, Cl. 441-64.000.

Nehyo, Takeshi: *See*—
Brackmann, Warren A.; Snaidr, Stanislav M.; Nehyo, Takeshi; and Sheahan, Michael H., 4,953,570, Cl. 131-109.100.

Neidhard, Klaus: *See*—
Alberter, Gunther; Deeg, Helmut; Hettich, Gerhard; Neidhard, Klaus; Schmid, Hans-Dieter; and Schrumpf, Hans, 4,954,677, Cl. 200-834.000.

Neifeld, Richard A., to United States of America, Army. Method of preparing a thin diamond film. 4,954,365, Cl. 427-53.100.

Neil, Daniel C.: *See*—
Banning, Harmon W.; and Neil, Daniel C., 4,954,669, Cl. 174-75.00C.

Nekoosa Packaging Corporation: *See*—
Noland, Carl M., 4,953,782, Cl. 229-157.000.

Nekovar, Anton, to Siemens Aktiengesellschaft. X-ray diagnostics installation. 4,955,043, Cl. 378-108.000.

Nelson, Charles M.: *See*—
Price, Donald; Price, Frank; and Nelson, Charles M., 4,954,202, Cl. 156-353.000.

Nelson Industries, Inc.: *See*—
Printiss, Frederick H., Sr., 4,953,899, Cl. 285-420.000.

Nelson, John M., to Newell Companies, Inc. Spark igniter system. 4,954,078, Cl. 431-255.000.
Nelson, Lawrence L. Heated cockroach trap. 4,953,320, Cl. 43-121.000.
Nelson, Neal. Improved cable for coupling between data terminals and data sets. 4,954,101, Cl. 439-502.000.
Nelson Research & Development Company: *See*—
Wiegand, Karl E.; and Rude, Robert K., 4,954,448, Cl. 435-232.000.
Nelson, Richard D.; and Herrell, Dennis J., to Microelectronics and Computer Technology Corporation. Low pressure high heat transfer fluid heat exchanger. 4,953,634, Cl. 165-147.000.
Nemeth, Sandor: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.
Nemoto, Ichiro: *See*—
Nakagawa, Tadashi; Otora, Takahito; and Nemoto, Ichiro, 4,954,860, Cl. 354-246.000.
Nenadic, Anton: *See*—
Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, 4,954,142, Cl. 51-309.000.
Nestec S.A.: *See*—
Akesson, Rune; and Pegoraro, Giuliano, 4,953,644, Cl. 177-145.000.
Hsu, Sheng H., 4,954,060, Cl. 425-85.000.
Neves, Mendes L.: *See*—
Jos, Doucet; and Neves, Mendes L., 4,954,213, Cl. 156-49.000.
Nevins, Donald J.; and Nishitani, Kazuhiko, to University of California, The Regents of the. Feraxanase, a highly specific enzyme for hydrolysis of complex polysaccharides. 4,954,447, Cl. 435-200.000.
New Japan Chemical Co., Ltd.: *See*—
Kobayashi, Toshiaki; and Motomatsu, Keiko, 4,954,291, Cl. 252-315.100.
Neward, Theodore C. Hand-held vacuum and pressure pump. 4,954,054, Cl. 417-440.000.
Newell Companies, Inc.: *See*—
Nelson, John M., 4,954,078, Cl. 431-255.000.
Newell, Harold R., to Messr-Matic Electronics Corp. Electronic musical instrument with quantized resistance strings. 4,953,439, Cl. 84-655.000.
Newman, Cathy D.: *See*—
DeVolk, Burton; Allen, Fritz; Newman, Cathy D.; and Fraatz, Robert J., 4,953,980, Cl. 356-338.000.
Ng, Cher Y.: *See*—
Wong, Soon F.; Leong, Chee S.; and Ng, Cher Y., 4,955,071, Cl. 455-90.000.
NGK Insulators, Ltd.: *See*—
Ito, Toshikazu; Harada, Takashi; and Hamanaka, Toshiyuki, 4,953,627, Cl. 165-8.000.
Oikawa, Hiroshi; Nakashima, Naohisa; Matsuhisa, Tadaaki; and Ozawa, Tadao, 4,953,528, Cl. 123-276.000.
NGK Spark Plug Co., Ltd.: *See*—
Suzuki, Takahiro; Inuoka, Yuki; and Aoki, Noboru, 4,954,743, Cl. 313-120.000.
Nguyen, John Q.: *See*—
Munach, Arnold S.; and Nguyen, John Q., 4,953,475, Cl. 102-229.000.
Nicholson, Alyce E.: *See*—
Wierenga, Thomas J.; Ladd, Joseph M., Jr.; Merz, Russell J.; and Nicholson, Alyce E., 4,954,285, Cl. 252-174.110.
Niedzwiecki, Joseph L.: *See*—
Lipkin, Gregory M.; and Niedzwiecki, Joseph L., 4,954,247, Cl. 208-355.000.
Nieman, Gerald R.; Clyatt, Clarence L., III; Paulus, Eric J.; Zehrung, Scott A.; Ragl, Albert; and Moore, John R., to ITT Corporation. Filter contact. 4,954,794, Cl. 333-182.000.
Nifco Inc.: *See*—
Sugita, Tooru, 4,953,907, Cl. 296-93.000.
Nihon Parkerizing Co., Ltd.: *See*—
Sako, Ryohsuke; Hasebe, Akihiko; Nishihara, Akira; and Okita, Hiroshi, 4,954,372, Cl. 427-388.200.
Nikken Chemical Laboratory Co., Ltd.: *See*—
Yoshida, Hajime, 4,954,173, Cl. 106-2.000.
Nikku Industry Co., Ltd.: *See*—
Kawasaki, Takuya; and Kawakami, Osamu, 4,953,368, Cl. 18-5.00C.
Nikon Corporation: *See*—
Ejima, Satoshi; and Yamamoto, Tetsuya, 4,954,897, Cl. 358-228.000.
Nilssen, Ole K. Controlled electronic ballast. 4,954,754, Cl. 315-219.000.
Nimlok Limited: *See*—
Wilson, Mervyn; Gibbons, Martin; and Perutz, Simon, 4,953,338, Cl. 52-586.000.
Nippon Cable System, Inc.: *See*—
Onimaru, Sadahiro; Kuratani, Fumiyasu; and Yoshino, Hiroyoshi, 4,953,672, Cl. 188-378.000.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwanami, Teruo; Miyata, Shigeo; and Moriyama, Takamasa, 4,954,557, Cl. 524-399.000.
Oishi, Tsukasa; and Okuda, Tomohisa, 4,954,567, Cl. 525-62.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Suzuki, Shintaro; Yanagisawa, Noriaki; and Ohkuma, Taka'aki, 4,954,522, Cl. 514-492.000.
Tatee, Tochiro; Takahira, Takashi; Yamashita, Kouwa; Sakurai, Masao; Shiozawa, Akira; and Narita, Kazuhisa, 4,954,642, Cl. 549-389.000.
Nippon Oil and Fats Company, Limited: *See*—
Suyama, Shuji; and Higuchi, Yoshiki, 4,954,656, Cl. 568-567.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Tsukada, Toru, 4,953,988, Cl. 384-8.000.
Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Azeta, Takahiro; Kameyama, Toru; Sekiya, Harukazu; Moritani, Toshifumi; Higeta, Akira; Baba, Kenji; Matoba, Takeshi; Goto, Shinji; and Kubota, Kazuyuki, 4,953,846, Cl. 271-251.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Katsuki, Kazuo; Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, 4,955,060, Cl. 382-32.000.
Pierce, Gerald A., 4,955,063, Cl. 382-18.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Abe, Tadashi; Manabe, Mitsuyoshi; Deguchi, Koji; Uhara, Hiroyuki; and Aoki, Yukio, 4,954,650, Cl. 562-534.000.
Nippon Steel Welding Products & Engineering Co., Ltd.: *See*—
Araki, Nobuo; Tabata, Kazufumi; Yokoi, Kiyomi; and Ashidate Tadami, 4,953,827, Cl. 254-134.400.
Nippon Zeon Co., Ltd.: *See*—
Kubo, Yoichiro; and Ohura, Kiyomori, 4,954,576, Cl. 525-339.000.
Nishi, Hisami: *See*—
Katsuki, Kazuo; Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, 4,955,060, Cl. 382-32.000.
Nishi, Kunihiko: *See*—
Saeki, Junichi; Kaneda, Aizo; and Nishi, Kunihiko, 4,954,301, Cl. 264-40.100.
Nishibayashi, Katsumi; and Teshima, Takashi, to Mita Industrial Co., Ltd. Static latent image development toner. 4,954,411, Cl. 430-111.000.
Nishida, Kozi: *See*—
Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, 4,954,575, Cl. 525-330.500.
Nishida, Tetsuya; Terao, Motoyasu; Miyauchi, Yasushi; and Horigome, Shinkichi, to Hitachi, Ltd. Information recording thin film and method for recording information. 4,954,379, Cl. 428-64.000.
Nishihara, Akira: *See*—
Sako, Ryohsuke; Hasebe, Akihiko; Nishihara, Akira; and Okita, Hiroshi, 4,954,372, Cl. 427-388.200.
Nishijima, Toyoki; and Tanji, Masaki, to Konica Corporation. Silver halide photographic light-sensitive material. 4,954,431, Cl. 430-546.000.
Nishijima, Toyoki, to Konica Corporation. Photographic material with solvent having dielectric constant of 6 or less and yellow coupler. 4,954,432, Cl. 430-546.000.
Nishikawa, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Dental radiographic apparatus for photographing entire jaws. 4,955,042, Cl. 378-39.000.
Nishikawa, Kazuya: *See*—
Shinnai, Masao; Nishikawa, Kazuya; Tsukada, Tokio; and Hirotsu, Tohru, 4,954,797, Cl. 343-704.000.
Nishikawa, Kohei: *See*—
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,954,625, Cl. 540-500.000.
Nishiki, Naomi: *See*—
Murakami, Mutsuaki; Nishiki, Naomi; Yoshimura, Susumu; and Watanabe, Kazuhiro, 4,954,193, Cl. 156-155.000.
Nishimura, Akira, to Kabushiki Kaisha Nishimura Jig. Vice jig. 4,953,840, Cl. 269-282.000.
Nishimura, Akira; and Nakasuji, Masaaki, to Sumitomo Electric Industries, Ltd. Transmission protective coated optical fiber tape. 4,953,945, Cl. 350-96.230.
Nishitani, Kazuhiko: *See*—
Nevins, Donald J.; and Nishitani, Kazuhiko, 4,954,447, Cl. 435-200.000.
Nishiura, Masaharu; Ichimura, Takeshige; and Kamiyama, Michinari, to Fuji Electric Company Ltd.; and Fuji Electric Corporate Research and Development Ltd. Solar cell module and method of manufacture. 4,954,181, Cl. 136-244.000.
Nishiyama, Yukio; Fujioka, Junzo; Hino, Haruki; Matsuzaki, Yuji; Sakiyama, Masayuki; and Yokoyama, Minoru, to Kawasaki Jukogyo Kabushiki Kaisha. Method and apparatus for manufacturing synthetic products. 4,954,314, Cl. 419-45.000.
Nishizawa, Hiroshi: *See*—
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.
Nissan Chemical Industries Ltd.: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Suzuki, Koichi, 4,954,165, Cl. 71-103.000.
Suzuki, Fumio; Iwasawa, Yoshihiro; Sato, Toshiaki; Ikai, Takasi; and Oguti, Toshiko, 4,954,164, Cl. 71-92.000.
Nissan Motor Co., Ltd.: *See*—
Imaseki, Takashi; and Kobari, Yuji, 4,953,654, Cl. 180-197.000.
Kawagoe, Kenji; Ito, Hideo; and Yokote, Masatsugu, 4,954,957, Cl. 364-424.050.
Maeda, Kouzo; Yoshioka, Masanobu; and Hikone, Makoto, 4,953,423, Cl. 74-552.000.
Maekawa, Junichi; Abe, Masanori; Ienaga, Hirofumi; and Hashimoto, Shigeaki, 4,953,910, Cl. 296-223.000.
Nissen, Peter: *See*—
Appel, Eggert; Kiene, Wilfried; Kuchemann, Rudi; Meier, Dieter; and Nissen, Peter, 4,953,408, Cl. 73-861.160.
Nisshin Oil Mills, LTD., The: *See*—
Yamada, Osamu; and Fujita, Tadasu, 4,954,443, Cl. 435-178.000.

Nisshin Steel Co., Ltd.: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,954,235, Cl. 204-273.000.
Nitecki, Danute E.; and Aldwin, Lois, to Cetus Corporation. Certain maleimide-N-alkylenecarboxylate-ortho-nitrobenzenesulfonic acid esters and derivatives useful for coupling biological materials. 4,954,637, Cl. 548-546.000.
Nitrokelepek: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.
Nitta, Yoshihiko: *See*—
Kaijima, Ryota; Ihara, Hirokazu; Nitta, Yoshihiko; and Kaji, Hiroyuki, 4,954,984, Cl. 364-900.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Hosaka, Yoshifumi; Otsuka, Saburo; Kinoshita, Takashi; and Ito, Yusuke, 4,954,343, Cl. 424-448.000.
Nitto Kogyo Kabushiki Kaisha: *See*—
Kubota, Shigeru; Kanou, Shoji; and Kubo, Masahiro, 4,953,749, Cl. 221-168.000.
Niwa, Koichi: *See*—
Imanaka, Yoshihiko; Machi, Takato; Yamanaka, Kazunori; Yokoyama, Hiromitsu; Kamehara, Nobuo; and Niwa, Koichi, 4,954,480, Cl. 505-1.000.
Noboru, Mitsuhiro, to Sharp Kabushiki Kaisha. Low noise converter. 4,955,076, Cl. 455-188.000.
Noguchi, Koichi: *See*—
Koike, Tadao; Noguchi, Koichi; Takahashi, Hiroshi; and Tsunoda, Koichi, 4,954,849, Cl. 355-319.000.
Noguchi, Yoshihiro, to Nakamichi Corporation. Stationary tape guide for a magnetic tape recorder. 4,953,807, Cl. 242-76.000.
Noji, Toshiyuki; Yoshida, Hidetoshi; Tatsumi, Eiji; Akao, Shinichi; and Kosaka, Hideyuki, to Mitsui Kensetsu Kabushiki Kaisha. Damping device in a structure and damping construction and damping method using those devices. 4,953,330, Cl. 52-167.0DF.
Nojima, Hiroshi: *See*—
Oguro, Katsunori; Nojima, Hiroshi; Hashizume, Nobuyuki; Ohno, Norio; and Naito, Taketoshi, 4,954,512, Cl. 514-352.000.
Nolan, Michael P.: *See*—
Hira, Gerald M.; Sheahen, Dana M.; Wilson, Pamela L.; and Nolan, Michael P., 4,954,948, Cl. 364-200.000.
Noland, Carl M., to Nekoosa Packaging Corporation. Fresh produce shipping container with self-locking top. 4,953,782, Cl. 229-157.000.
Nolf, Jean-Marie E.: *See*—
Jensen, Michael L.; Nolf, Jean-Marie E.; Vansant, Jan; and Mendes, Luiz N., 4,954,670, Cl. 174-92.000.
Nolle, William: *See*—
Markow, Paul A.; and Nolle, William, 4,953,797, Cl. 242-7.110.
Nomafa AB: *See*—
Larsson, Nils H. I., 4,953,608, Cl. 160-1.000.
Nomura, Ichiro: *See*—
Suzuki, Hidetoshi; and Nomura, Ichiro, 4,954,744, Cl. 313-336.000.
Nomura, Kenji: *See*—
Uchikawa, Fusaoki; and Nomura, Kenji, 4,954,413, Cl. 430-135.000.
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, to Hitachi Chemical Co., Ltd. Solvent-soluble polyimide and production thereof. 4,954,612, Cl. 528-353.000.
Nonaka, Naomichi: *See*—
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoyu; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.
Nonaka, Wataru: *See*—
Koda, Atsushi; Okuda, Shinji; and Nonaka, Wataru, 4,954,915, Cl. 360-92.000.
Noonan, Kevin K., to Sophis Systems N.V. Method for simulating dyed fabric. 4,954,976, Cl. 364-578.000.
Norabel AB: *See*—
Lande, Goran, 4,953,775, Cl. 228-107.000.
Nordco Limited: *See*—
Guigne, Jacques Y., 4,955,001, Cl. 367-118.000.
Norman Company, The: *See*—
Gortz, Norman, 4,953,753, Cl. 222-105.000.
Norman, Richard; Norman, Sonja; and Chamberlain, David, to Profitable Entertainment Products, Inc. Tossable strategy-type game with tri-dimensional playing surface. 4,953,870, Cl. 273-241.000.
Norman, Sonja: *See*—
Norman, Richard; Norman, Sonja; and Chamberlain, David, 4,953,870, Cl. 273-241.000.
Norris, Thomas R. Fluid blow-off muffler. 4,953,659, Cl. 181-257.000.
Norsolor: *See*—
Boinot, Francois; Cousin, Michel; Hochin, Andre ; and Meyer, Nicolas, 4,954,394, Cl. 428-289.000.
Norsworthy, John P.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,955,024, Cl. 371-40.100.
North American Philips Corporation: *See*—
Crawford, Joseph A., 4,954,749, Cl. 315-97.000.
Northern Telecom Limited: *See*—
Ho, Vu Quoc, 4,954,214, Cl. 156-628.000.
Norton Company: *See*—
Butcher, Kenneth R.; Doddato, Carmine M.; and Stough, Donna M., 4,954,138, Cl. 51-293.000.
Comert, Ahmet; Ladang, Michel; and Petit, Dominique, 4,953,885, Cl. 280-610.000.
Notari, Bruno: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,954,653, Cl. 564-223.000.
Notenboom, Leo A., to Microsoft Corporation. Compressing and decompressing text files. 4,955,066, Cl. 382-56.000.
Nova-Tech Engineering, Inc.: *See*—
Herrmann, Karl H., 4,953,324, Cl. 49-255.000.
Nowlin, Thomas E.; and Schurzky, Kenneth G., to Mobil Oil Corporation. Chlorinated alcohol-containing catalyst composition for polymerizing alpha-olefins. 4,954,470, Cl. 502-107.000.
Nozaki, Yuri: *See*—
Tani, Sumio; Kogoh, Kazuhiko; Nozaki, Yuri; and Oshima, Kunihiro, 4,954,399, Cl. 428-402.000.
NPD Research, Inc.: *See*—
Coffey, Steve; and Weber, William, 4,954,699, Cl. 235-462.000.
Nu-Jer Electronics & Mfg. Inc.: *See*—
Willing, Jere J., 4,954,062, Cl. 425-135.000.
Nulty, James E.: *See*—
Gabriel, Calvin T.; and Nulty, James E., 4,954,212, Cl. 156-627.000.
Nuova Sanac S.p.A.: *See*—
Foglio, Salvatore, 4,953,760, Cl. 222-600.000.
Nurra, Carmelo: *See*—
Messina, Giuseppe; Nurra, Carmelo; Cappellazzo, Oscar; Virdis, Angelo; and Lorenzoni, Loreno, 4,954,660, Cl. 568-697.000.
N.V. Bekaert S.A.: *See*—
DeWitte, Marc, 4,954,183, Cl. 148-15.000.
O. M. Scott & Sons Company, The: *See*—
Goertz, Harvey M., 4,954,154, Cl. 71-3.000.
Obayashi, Akira: *See*—
Yoshihama, Yoshio; Kagaya, Asuka; Matsui, Susumu; and Obayashi, Akira, 4,954,445, Cl. 435-191.000.
Obitsu, Takeo; Ohnishi, Yutaka; Yoshinaka, Shinji; Koguchi, Minoru; Yanagita, Mitsuhiro; and Hirai, Nobuyuki, to Shin Nisso Kako Co., Ltd. Fluoran compounds and color forming recording materials using same. 4,954,631, Cl. 546-15.000.
Obrecht, Werner; Wendling, Peter; Musch, Rudiger; and Muller, Eberhard, to Bayer Aktiengesellschaft. Process for the production of sulfur-modified polychloroprene. 4,954,585, Cl. 526-220.000.
O'Brien, John J.: *See*—
Phillips, William R.; Bush, Blaine A.; O'Brien, John J.; and Thalken, Charles R., 4,953,610, Cl. 160-84.100.
Occidental Chemical Corporation: *See*—
Fertel, Lawrence B.; and O'Reilly, Neil J., 4,954,639, Cl. 548-475.000.
Oda, Tatsuharu: *See*—
Arata, Yoshiaki; and Oda, Tatsuharu, 4,953,950, Cl. 350-174.000.
Odaka, Kentaro, to Sony Corporation. Encoding apparatus and method for error correction. 4,955,022, Cl. 371-37.400.
Odle, Herbert A.: *See*—
Hammond, Douglas S.; and Odle, Herbert A., 4,954,935, Cl. 362-245.000.
Offer, Henry P.: *See*—
Dixon, Robert C.; Deaver, Gerald A.; Punches, James R.; Singleton, Guy E.; Erbes, John G.; and Offer, Henry P., 4,954,311, Cl. 376-258.000.
Oftring, Alfred; Tschang, Chung-Ji; Winkler, Ekhard; Gotsmann, Guenther; and Glaser, Klaus, to BASF Aktiengesellschaft. Chemical deposition of copper from alkaline aqueous baths. 4,954,369, Cl. 427-430.100.
Ogata, Toshikazu: *See*—
Yasufuku, Hitoshi; and Ogata, Toshikazu, 4,953,784, Cl. 236-44.00A.
Ogawa, Masaharu: *See*—
Nakatsu, Keiji; and Ogawa, Masaharu, 4,955,009, Cl. 369-32.000.
Ogawa, Syozo: *See*—
Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.
Ogawa, Taro: *See*—
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; Ogawa, Taro; and Kimura, Takeshi, 4,954,424, Cl. 430-323.000.
Ogawa, Yasuaki: *See*—
Yamamoto, Masaki; Takada, Shigeyuki; and Ogawa, Yasuaki, 4,954,298, Cl. 264-4.600.
Ogihara, Satoru: *See*—
Nakanishi, Keiichirou; Yamada, Minoru; Yamamoto, Masakazu; Ogihara, Satoru; Shinohara, Hiroichi; and Suzuki, Hideo, 4,954,877, Cl. 357-80.000.
Ogura, Kuniaki: *See*—
Takajo, Shigeaki; Furukimi, Osamu; Ogura, Kuniaki; Maruta, Keiichi; Abe, Teruyoshi; and Sakurada, Ichio, 4,954,171, Cl. 75-246.000.
Ogura, Takashi: *See*—
Taniguchi, Kouji; Ogura, Takashi; and Tanaka, Koicji, 4,954,746, Cl. 313-506.000.
Oguro, Katsunori; Nojima, Hiroshi; Hashizume, Nobuyuki; Ohno, Norio; and Naito, Taketoshi, to Okamoto, Shosuke; and Showa Denko Kabushiki Kaisha. Anti-ulcer composition. 4,954,512, Cl. 514-352.000.

Oguti, Toshiko: *See—*
Suzuki, Fumio; Iwasawa, Yoshihiro; Sato, Toshiaki; Ikai, Takasi; and Oguti, Toshiko, 4,954,164, Cl. 71-92.000.
Ohba, Shinya: *See—*
Akimoto, Hajime; and Ohba, Shinya, 4,954,895, Cl. 358-213.110.
Ohbayashi Corporation: *See—*
Goto, Yozo, 4,953,658, Cl. 181-207.000.
Ohi, Kazumi: *See—*
Ohtake, Toshikazu; Hayashi, Munekazu; Idemura, Satoshi; Ohi, Kazumi; and Kunitake, Yuji, 4,954,304, Cl. 264-137.000.
Ohi Seisakusho Co., Ltd.: *See—*
Maekawa, Junichi; Abe, Masanori; Ienaga, Hirofumi; and Hashimoto, Shigeaki, 4,953,910, Cl. 296-223.000.
Ohkawa, Takehiko: *See—*
Oku, Teruo; Kasahara, Ciyoshi; Ohkawa, Takehiko; and Hashimoto, Masashi, 4,954,496, Cl. 514-231.500.
Ohkita, Teruhiko: *See—*
Fukao, Hiroaki; Ohkita, Teruhiko; Nagasaka, Nobusuke; and Ueno, Tateo, 4,953,484, Cl. 112-162.000.
Ohkuma, Taka'aki: *See—*
Suzuki, Shintaro; Yanagisawa, Noriaki; and Ohkuma, Taka'aki, 4,954,522, Cl. 514-492.000.
Ohmi, Tadahiro; Kanno, Yohichi; Satoh, Kazuhiko; and Hatayama, Tadahiro, to Motoyama Eng. Works, Ltd. Metal diaphragm valve. 4,953,826, Cl. 251-331.000.
Ohmura, Hiroshi, to Mazda Motor Corporation. Rear wheel steering apparatus. 4,953,648, Cl. 180-79.100.
Ohmura, Hiroshi, to Mazda Motor Company. Rear wheel steering control system. 4,953,650, Cl. 180-79.100.
Ohmura, Hiroshi; Nakashima, Takashi; and Murai, Takeshi, to Mazda Motor Corporation. Four-wheel steering system for motor vehicle. 4,953,652, Cl. 180-140.000.
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package. 4,954,858, Cl. 354-145.100.
Ohmura, Hiroshi: *See—*
Mochida, Mitsuyoshi; Maekawa, Tokuo; Takei, Hisashi; Matsumoto, Yasuo; Ohmura, Hiroshi; Sugimoto, Shigeru; Ushiro, Seimei; Asano, Seiji; and Yoshida, Toshio, 4,954,857, Cl. 354-75.000.
Ohnishi, Yutaka: *See—*
Obitsu, Takeo; Ohnishi, Yutaka; Yoshinaka, Shinji; Koguchi, Minoru; Yanagita, Mitsuhiro; and Hirai, Nobuyuki, 4,954,631, Cl. 546-15.000.
Ohno, Norio: *See—*
Oguro, Katsunori; Nojima, Hiroshi; Hashizume, Nobuyuki; Ohno, Norio; and Naito, Taketoshi, 4,954,512, Cl. 514-352.000.
Ohnsorge, Horst: *See—*
Kuppers, Dieter; Herse, Klaus; Hiepe-Wohlleben, Kate; Kaiser, Manfred; Mohr, Friedemann; and Ohnsorge, Horst, 4,955,014, Cl. 370-3.000.
Ohrt, Dirk, to Rendamax BV. Process and device for conveying boilable liquids. 4,954,048, Cl. 417-209.000.
Ohta, Shigetoshi: *See—*
Tanemura, Fumikazu; Honda, Tohru; Ohta, Shigetoshi; Kajita, Yoshiharu; and Kachi, Tatsushi, 4,954,460, Cl. 501-80.000.
Ohtaka, Keiji: *See—*
Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 4,954,701, Cl. 250-201.800.
Ohtake, Toshikazu; Hayashi, Munekazu; Idemura, Satoshi; Ohi, Kazumi; and Kunitake, Yuji, to Dainippon Ink and Chemical, Inc. Process for producing prepreg and laminated sheet. 4,954,304, Cl. 264-137.000.
Ohtsuka, Naoji, to Canon Kabushiki Kaisha. Magnet and method of manufacturing the same. 4,954,800, Cl. 335-284.000.
Ohura, Kiyomori: *See—*
Kubo, Yoichiro; and Ohura, Kiyomori, 4,954,576, Cl. 525-339.000.
Ohyama, Tsukasa: *See—*
Takuma, Keisuke; Ohyama, Tsukasa; Ghoda, Isamu; Mikoda, Tamio; Koshida, Hitoshi; and Igata, Akitoshi, 4,954,410, Cl. 430-109.000.
Ohzu, Hayao, to Canon Kabushiki Kaisha. Color line sensor apparatus. 4,954,703, Cl. 250-208.100.
Oikawa, Hiroshi; Nakashima, Naohisa; Matsuhisa, Tadaaki; and Ozawa, Tadao, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Direct injection-type diesel engines. 4,953,528, Cl. 123-276.000.
Oikawa, Ryuetsu, to Yazaki Corporation. Clip. 4,953,801, Cl. 248-65.000.
Oikawa, Toru: *See—*
Shinagawa, Yukio; Oikawa, Toru; Yamanouchi, Junichi; and Shiratsuchi, Kentaro, 4,954,419, Cl. 430-215.000.
Oishi, Tsukasa; and Okuda, Tomohisa, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing polyvinyl alcohol having high degree of polymerization. 4,954,567, Cl. 525-62.000.
Oizumi, Hiroaki: *See—*
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; Ogawa, Taro; and Kimura, Takeshi, 4,954,424, Cl. 430-323.000.
Oka, Masahiko; Uemoto, Hiroshi; and Iwasaki, Yasuji, to Daikin Industries Ltd. Novel fluorine-containing non-crystalline copolymer. 4,954,588, Cl. 526-247.000.
Oka, Tateki; Toyoshi, Naoki; and Toda, Kunio, to Minolta Camera Kabushiki Kaisha. Electrophotographic image forming apparatus. 4,954,843, Cl. 355-210.000.
Oka, Tetsuo: *See—*
Katsumata, Ryoichi; Mizukami, Toru; and Oka, Tetsuo, 4,954,441, Cl. 435-115.000.
Okada, Mizuo: *See—*
Ito, Akira; and Okada, Mizuo, 4,953,948, Cl. 350-128.000.
Okada, Tadao: *See—*
Kondo, Hiroshi; and Okada, Tadao, 4,953,656, Cl. 180-226.000.
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Okino, Yoshinori, to Mazda Motor Corporation. Slip control system for lock-up clutch of automatic transmission. 4,953,679, Cl. 192-0.096.
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Lewis, Brian G., 4,953,487, Cl. 118-620.000.
Schiessl, Henry W.; and Manke, Steven A., 4,954,614, Cl. 528-483.000.
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Ishiwata, Hiroshi; Ikegame, Tetsuo; and Ikari, Ichiro, 4,953,959, Cl. 350-432.000.
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Ono, Hisao; Sato, Ryuji; and Miyachi, Takumi, to Japan Synthetic Rubber Company, Ltd. Catalyst for polymerization of conjugated diene and process for producing conjugated diene polymer. 4,954,125, Cl. 526-138.000.
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Oppliger, Max, to Sandoz Ltd. Mixtures of a 1:1 copper or nickel complex of a stilbene-azo or stilbene-azoxy compound having two 4,4'-(2,2'-disulfostilbenylene) radicals and a 1:1 copper or nickel complex of a stilbene-azo or stilbene-azoxy compound having one such radical. 4,954,133, Cl. 8-681.000.
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Ozaki, Keiichi; Manabe, Naoki; Shibata, Tatsumi; Hayashi, Hideharu; Muramatsu, Yukio; and Yamamoto, Masaki, to Yazaki Corporation. Wiring connection apparatus. 4,954,102, Cl. 439-535.000.
Ozawa, Kazuhiro: *See*—
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Degen, Peter J.; Rothman, Isaac; and Gsell, Thomas C., 4,954,256, Cl. 210-490.000.
Panster, Peter; and Kleinschmit, Peter, to Degussa Aktiengesellschaft. Formed, polymeric, tertiary or secondary organosiloxane amine compounds, methods of their preparation and use. 4,954,599, Cl. 528-38.000.
Paoli, Stephen A. Single process desinewing and deboning machine and method. 4,953,794, Cl. 241-24.000.
Paquin, Gregory J., to Ricon Corporation. Wayside lift. 4,953,665, Cl. 187-9.00R.
Pardini, Ronald S.: *See*—
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Parish, David M.: *See*—
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Park, Han-su, to Samsung Electronics Co., Ltd. Double capacitor and manufacturing method thereof. 4,954,927, Cl. 361-328.000.
Park, Hong C., to Goldstar Co., Ltd. Driving method for 3-D high luminance LCD projector. 4,954,890, Cl. 358-88.000.
Parker, Alonzo E., Jr. Interchangeable passive exercising apparatus. 4,953,541, Cl. 128-25.00R.
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Hassler, William L., Jr., 4,954,931, Cl. 362-32.000.
Parker, Merle D., to Hughes Aircraft Company. Scanwheel assembly with strain relieved hub. 4,953,925, Cl. 350-6.100.
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Parr, Edward L.: *See*—
Leary, Joseph E.; and Parr, Edward L., 4,954,223, Cl. 203-1.000.

Parsons, Bryan N. V., to Jaguar Cars Limited. Linear actuator. 4,954,735, Cl. 310-82.000.

Parsons, Kevin L.; Grundy, Gary M.; and Dunstan, Jacqueline M. Baton clip. 4,953,769, Cl. 224-247.000.

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Passalacqua, Vincent, to Mark-O Industries. Valve construction. 4,953,758, Cl. 222-341.000.

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Patrick, William J.: *See*—
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Patron, Christian S. A. E., to U.S. Philips Corporation. Multi-grid electron tube high frequency power oscillator. 4,954,792, Cl. 331-169.000.

Patterson, Don. Self draining valve member for use in underground water lines. 4,953,581, Cl. 137-107.000.

Patton, Ronald F.: *See*—
Cain, Bertram J.; Devon, Wesley S.; and Patton, Ronald F., 4,953,879, Cl. 280-47.190.

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Paul Schmidt: *See*—
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Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, to Hoechst Aktiengesellschaft. Copolymers of ethylene and methoxyacetic acid vinyl ester. 4,954,594, Cl. 526-320.000.

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Pearman, Arthur N. J.; Hunter, Gerald D.; Gilman, Robert E.; Woesner, Michael A.; and Lyden, Daniel T., to Gas Research Institute. Method and apparatus for proving electronic gas meters. 4,953,386, Cl. 73-3.000.

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Pem All Fire Extinguisher Corporation: *See*—
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Penz, Perry A.; and Gately, Michael T., to Texas Instruments Incorporated. Neural network and system. 4,954,963, Cl. 364-513.000.

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Perkins, Bernard C. Two stage flapper valve for fluid reservoirs. 4,953,237, Cl. 4-324.000.

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Peschka, Walter: *See*—
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Peters, Michael X. Work positioning device. 4,953,838, Cl. 269-45.000.

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Pettersson, Birger: *See*—
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Becker, Thomas K.; Casavant, Terry S.; Helm, P. Ralph; Petzold, Terry L.; Wanek, Michael J.; and Zuehlke, Art G, 4,953,722, Cl. 212-156.000.

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Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 4,954,501, Cl. 514-252.000.

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Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., to Visual Information Technologies, Inc. High speed image processing computer with error correction and logging. 4,955,024, Cl. 371-40.100.

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Maeda, Hiroshi; Tone, Junsuke; Ruddock, John C.; and Holdom, Kelvin S., 4,954,482, Cl. 514-8.000.
Mylari, Banavara L.; and Zembrowski, William J., 4,954,629, Cl. 544-237.000.
Urban, Frank J., 4,954,647, Cl. 558-46.000.

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Tsumura, Tomoki, 4,954,969, Cl. 364-521.000.

Phifer, Greg. Ashtray replacement drink holder. 4,953,772, Cl. 224-282.000.
Phillips, Bobby M.: *See—*
Bagrodia, Shriram; and Phillips, Bobby M., 4,954,398, Cl. 428-400.000.
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Bailey, Fay W., 4,954,545, Cl. 524-158.000.
Efner, Howard F., 4,954,654, Cl. 564-446.000.
Fu, Chia-Min; and Maholland, Michael K., 4,954,244, Cl. 208-120.000.
Hopkins, Thomas R.; and Banasiak, Dennis S., 4,954,354, Cl. 426-8.000.
Johnson, Marvin M.; and Tabler, Donald C., 4,954,467, Cl. 502-26.000.
Phillips, Robert E.; and Otsap, Ben A. Quick acting diversion valves. 4,953,579, Cl. 137-106.000.
Phillips, Sharon E. T.; and Eastmond, Bruce C., to Motorola, Inc. Dual mode radio transceiver for an SSB communication system. 4,955,083, Cl. 455-47.000.
Phillips, William R.; Bush, Blaine A.; O'Brien, John J.; and Thalken, Charles R., to Ultimate Window Coverings, Inc. Double window shade assembly with independent shade movement. 4,953,610, Cl. 160-84.100.
Phoenix Engineering, Inc.: *See—*
Langford, Frederic E., 4,953,919, Cl. 305-31.000.
Picanol N.V.: *See—*
Van Bogaert, Philippe; and Ampe, Frank, 4,953,597, Cl. 139-452.000.
Piccard, Don. Mechanical oil can seal breaker. 4,953,706, Cl. 206-603.000.
Pickett, George F. Single use lock. 4,953,900, Cl. 292-307.00R.
Pico-Glass, S.P.A.: *See—*
Astolfi, Pietro, 4,953,312, Cl. 40-156.000.
Pidskalny, Ronald S.; and Kneeshaw, Paul G., to American Cyanamid Company. Herbicidal composition and method for safening gramineous crops against heterocyclic phenyl ethers. 4,954,161, Cl. 71-88.000.
Pierce, Gerald A., to Nippon Sheet Glass Co., Ltd. Vector display apparatus. 4,955,063, Cl. 382-18.000.
Pierce, Gerald A.: *See—*
Katsuki, Kazuo; Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, 4,955,060, Cl. 382-32.000.
Pilkington Visioncare Holdings, Inc.: *See—*
Belmares, Hector, 4,954,591, Cl. 526-264.000.
Pinney, Richard C. Framework for cabinet structure. 4,954,007, Cl. 403-172.000.
Pinter, Erwig O.: *See—*
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.
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Piontek, Hubert: *See—*
Hahn, Peter; Piontek, Hubert; Schnegg, Anton; and Zulehner, Werner, 4,954,189, Cl. 148-33.200.
Piper, James A.; and Ainsworth, Mark D., to MacQuarie University. Wavelength locked laser light source. 4,955,027, Cl. 372-18.000.
Pitney Bowes Inc.: *See—*
Riley, Gilbert N.; Holodnak, Richard S.; Malin, Richard A.; and Muller, Arno, 4,953,996, Cl. 400-162.200.
Tolmie, Robert J., Jr.; and Dolan, Donald T., 4,953,842, Cl. 271-2.000.
Pizur, Stephen J., Sr. String exerciser. 4,953,854, Cl. 272-93.000.
Pizzarella, Michael L.: *See—*
Salmela, Gordon O.; and Pizzarella, Michael L., 4,953,256, Cl. 16-1.00C.
Plastipak Packaging, Inc.: *See—*
Dunlap, Richard L., 4,954,070, Cl. 425-503.000.
Pleban, William M.: *See—*
Collins, George L.; Kim, Hongkyu; and Pleban, William M., 4,954,400, Cl. 428-414.000.
Plichta, Edward J.; and Behl, Wishvender K., to United States of America, Army. High temperature molten salt thermal electrochemical cell. 4,954,403, Cl. 429-103.000.
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Vara, Fulvio J.; Dougherty, James A.; and Plotkin, Jeffrey S., 4,954,593, Cl. 526-270.000.
Podgorsky, Joseph J.: *See—*
Rys, Karla J.; Greene, Alan P.; Osmer, Frederick S.; and Podgorsky, Joseph J., 4,954,282, Cl. 252-117.000.
Pogorzelski, James S.: *See—*
Freeman, William A.; Pogorzelski, James S.; Solie, Darryl W.; and Wilson, Jacqueline H., 4,954,950, Cl. 364-200.000.
Pohl, Hans-Christoph: *See—*
Jokisch, Friedrich; Linke, Adolf; and Pohl, Hans-Christoph, 4,954,136, Cl. 48-197.00R.
Pohl, Joachim: *See—*
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Polar Spring Corporation: *See—*
Chang, Chung-Nan; Conlon, William M.; and Hendricks, Donald M., 4,954,151, Cl. 62-532.000.
Polarek, Kenneth J., to World Color Press, Inc. Machine and process for separating signatures. 4,953,841, Cl. 270-58.000.
Pollak, Alfred; and Maszkiewicz, Michael, to HSC Research Development Corporation. Apparatus for time-resolved photography of fluorescence. 4,954,714, Cl. 250-458.100.
Polyplastics Co., Ltd.: *See—*
Nakane, Toshio; Hijikata, Kenji; Kageyama, Yukihiko; and Naka, Michiro, 4,954,540, Cl. 524-86.000.
Nakane, Toshio; Kageyama, Yukihiko; Konuma, Hiroaki; and Hijikata, Kenji, 4,954,341, Cl. 524-86.000.
Pomagalski S.A.: *See—*
Creissels, Denis, 4,953,468, Cl. 104-123.000.
Ponchel, Basil M.; and Walsh, James D., to Aluminum Company of America. High strength aluminum alloy resistant to exfoliation and method of making. 4,954,188, Cl. 148-417.000.
Ponsford, Roger J.; and Stachulski, Andrew V., to Beecham Group p.l.c. Penicillins having a substituted acrylamido side chain. 4,954,489, Cl. 514-195.000.
Pontevivo, Michele: *See—*
Bornengo, Giorgio; Carlini, Filippo M.; Pontevivo, Michele; and Bottaccio, Giorgio, 4,954,643, Cl. 549-531.000.
Poole, Samuel E., Jr. Drug administering endotracheal respiration systems. 4,953,547, Cl. 128-203.120.
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Mears, Robert J.; Reekie, Laurence; Poole, Simon B.; and Payne, David N., 4,955,025, Cl. 372-6.000.
Porter, William M. Climbing apparatus. 4,953,662, Cl. 182-135.000.
Postler, Gunter; Bock, Erich; von Entress-Fursteneck, Wolfgang; and Radenauer, Werner, to Diehl GmbH & Co. Ejectable member with parachute. 4,953,813, Cl. 244-147.000.
Potenziani, Ernest, II: *See—*
Leupold, Herbert A.; and Potenziani, Ernest, II, 4,953,555, Cl. 128-653.00A.
Potter, Michael W., to Shell Oil Company. Inhibition of sulfide inclusion in slag. 4,954,137, Cl. 48-210.000.
Potzler, J. Edward; and Strahan, Daryl J., to A. B. Dick Company. Method and apparatus for mapping frames of an updatable electrophotographic medium. 4,955,032, Cl. 364-525.000.
Poulain, Jean; and Desdouits, Jacques, to GEC Alsthom SA. Steam turbine installation with adjusted bleeding. 4,953,355, Cl. 60-663.000.
Poulgouras, Konstantinos. Method of making pizza dough. 4,954,357, Cl. 426-302.000.
Power Components of Midwest, Inc.: *See—*
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Powers, James C.; Kam, Chih-Min; Oweida, Steven W.; and Ku, David N., to Georgia Tech Research Corporation. Isocoumarins with basic substituents as serine proteases inhibitors, anticoagulants and anti-inflammatory agents. 4,954,519, Cl. 514-456.000.
Powers, John W.: *See—*
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PPG Industries, Inc.: *See—*
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Bull, Larry J.; Sieradzki, Raymond; and Olson, Kurt G., 4,954,556, Cl. 524-378.000.
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Prabhu, Satyen N.: *See—*
Fishman, Oleg; Prabhu, Satyen N.; Burk, John P.; and Tabatabaei, Emad, 4,953,761, Cl. 222-602.000.
Prager, Bernhard C., to Sandoz Ltd. Process for the production of cephalosporin derivatives. 4,954,624, Cl. 540-225.000.
Pratolongo, odesto, to Electronics for Industry, Ltd. Process for the fast cooking of pasta. 4,954,359, Cl. 426-557.000.
Precision Software Incorporated: *See—*
Boyd, Ferrell W., Jr.; Murdock, Michael; McCormack, Michael; and Darbee, Paul, 4,955,054, Cl. 379-269.000.
Preh-Werke GmbH & Co. KG: *See—*
Berthold, Gottfried; Limpert, Rudolf; and Fehr, Friedhard, 4,954,804, Cl. 338-162.000.
Prestolite Electric Incorporated: *See—*
Hammer, Joe K.; Fitzsimmons, Alan H.; and Greutmann, Hans, 4,953,284, Cl. 29-596.000.
Prevorsek, D. C.: *See—*
Li, H. L.; and Prevorsek, D. C., 4,953,234, Cl. 2-412.000.
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Prime, Martlyn L.; Warren, Peter F.; Johnston, Geoffrey D.; and Babidge, John C., to Stakvat Pty. Ltd. Vat. 4,953,730, Cl. 217-4.000.
Primozic, Randolph J., to Floraline Display Products Corp. Floral display case. 4,953,363, Cl. 62-255.000.
Prince Corporation: *See—*
Frye, Dale J.; Lindberg, Kenneth M.; Kindig, Alan L.; Stander, Robert J.; Buonodono, Joseph B.; Gras, Jeffrey D.; and Ozios, David A., 4,953,259, Cl. 16-225.000.
Van Lente, Paul S.; and Geerlings, Steven L., 4,953,305, Cl. 33-356.000.
Printiss, Frederick H., Sr., to Nelson Industries, Inc. Clamp assembly. 4,953,899, Cl. 285-420.000.
Pristine Products: *See—*
Dziekan, John T., 4,954,192, Cl. 156-154.000.

Probst, Frieder: *See*—
Schulz, Gunter; Probst, Frieder; and Guttler, Hermann, 4,953,350, Cl. 57-354.000.

Process Automation Business, Inc.: *See*—
Burk, Gary N.; McCanney, Thomas O.; and Williams, Paul, 4,954,891, Cl. 358-101.000.

Process Equipment Company: *See*—
Knasel, Harold E.; and Grigsby, David A., 4,954,005, Cl. 403-57.000.

Procter & Gamble Company, The: *See*—
Bissett, Donald L.; Bush, Rodney D.; and Chatterjee, Ranjit, 4,954,332, Cl. 424-59.000.
Cooper, Eugene R.; Loomans, Maurice E.; and Wickett, Richard R., 4,954,487, Cl. 514-159.000.
Rosario-Jansen, Theresa; and Lichtenwalter, Glen D., 4,954,635, Cl. 548-354.000.
Wierenga, Thomas J.; Ladd, Joseph M., Jr.; Merz, Russell J.; and Nicholson, Alyce E., 4,954,285, Cl. 252-174.110.

Profitable Entertainment Products, Inc.: *See*—
Norman, Richard; Norman, Sonja; and Chamberlain, David, 4,953,870, Cl. 273-241.000.

Prosenbauder, Otto. Tool holder for a pickling machine and tool combination for use in such a holder. 4,953,456, Cl. 99-533.000.

Prucher, Helmut, to Merck Patent Gesellschaft mit beschrankter Haftung. Pyridazinone derivatives. 4,954,499, Cl. 514-247.000.

Psychopax Limited: *See*—
Evamy, David L., 4,953,705, Cl. 206-594.000.

Puckette, Thomas A., to Eastman Kodak Company. Preparation of bidentate ligands. 4,954,227, Cl. 204-72.000.

Pugh, John F.; and Magallanes, Ann L., to Marine Hardware, Inc. Shaft-grounding stuffing box cover. 4,954,084, Cl. 439-29.000.

Pugh, Monroe S.; and Pugh, Robert L. Foot powder composition. 4,954,334, Cl. 424-68.000.

Pugh, Robert L.: *See*—
Pugh, Monroe S.; and Pugh, Robert L., 4,954,334, Cl. 424-68.000.

Pukalo, Walter P.: *See*—
Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,953,778, Cl. 228-173.600.

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Dixon, Robert C.; Deaver, Gerald A.; Punches, James R.; Singleton, Guy E.; Erbes, John G.; and Offer, Henry P., 4,954,311, Cl. 376-258.000.

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Purdue Research Foundation: *See*—
Gelvin, Stanton B.; and Veluthambi, K., 4,954,442, Cl. 435-172.300.

Puritan-Bennett Corporation: *See*—
Kumar, Viraraghavan S., 4,954,799, Cl. 335-236.000.

Putman, John B. Rheometer die assembly. 4,953,406, Cl. 73-843.000.

Puttmann, Franz-Josef; and Hesse, Alfons, to Paul Schmidt. Ram boring machine having a pull-and-turn reversing gear. 4,953,626, Cl. 173-91.000.

Putzig, Donald E.; and Smeltz, Kenneth C., to Du Pont de Nemours, E. I., and Company. Organic titanium compositions useful as cross-linkers. 4,953,621, Cl. 166-308.000.

Pyle Overseas B.V.: *See*—
Schreck, Daniel J.; and Ehrmann, Ronald G., 4,953,289, Cl. 29-863.000.

Quaker Oats Company, The: *See*—
Repholz, Kenneth M.; and Kanade, Pradeep G., 4,954,061, Cl. 425-131.100.

Quignon, Thierry: *See*—
Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, 4,954,961, Cl. 364-484.000.

Quisenberry, Terry. One way animal gate. 4,953,323, Cl. 49-58.000.

Raatikainen, Pentti: *See*—
Eskelinen, Pekka; Raatikainen, Pentti; Karlsson, Markku; and Virta, Raimo, 4,953,297, Cl. 34-23.000.

Raber, David C.: *See*—
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Rabiger, Norbert: *See*—
Vogelpohl, Alfons; and Rabiger, Norbert, 4,954,257, Cl. 210-607.000.

Rackebrandt, Karl-Heinz: *See*—
Marchewka, Werner; Rackebrandt, Karl-Heinz; Schafer, Klaus; and Seebode, Albert, 4,953,409, Cl. 73-861.170.

Rackur, Helmut E. W.: *See*—
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.

Radehaugh, Ray: *See*—
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RADVA Corporation: *See*—
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Rafalow, Lee M.: *See*—
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Rafka, Robert J.: *See*—
Friedman, Mark I.; Tordoff, Michael G.; DiNovi, Michael J.; and Rafka, Robert J., 4,954,531, Cl. 514-738.000.

Ragl, Albert: *See*—
Nieman, Gerald R.; Clyatt, Clarence L., III; Paulus, Eric J.; Zehrung, Scott A.; Ragl, Albert; and Moore, John R., 4,954,794, Cl. 333-182.000.

Ragsdale, Kelly, to Cover-Pools, Inc. Swimming pool anchor and removal tool. 4,953,269, Cl. 24-704.100.

Raible, Donald A.; and Morrow, William K., to Baxter International, Inc. Variable roller pump tubing. 4,954,055, Cl. 417-477.000.

Raible, Donald A., to Baxter International, Inc. Blood oxygenator. 4,954,317, Cl. 422-46.000.

Rains, Randall C.; Dormish, Jeffrey F.; Stanton, Susan A.; and Rieck, James N., to Mobay Corporation. Two component polyurethane adhesive. 4,954,199, Cl. 156-331.700.

Raitmaa, Raimo; and Jansson, Per-Olof, to Oy Master Instruments Ltd. Mask compass. 4,953,304, Cl. 33-355.00R.

Ramot University Authority of Applied Research and Industrial Development Ltd.: *See*—
Lerman, Ori; and Rozen, Shlomo, 4,954,648, Cl. 558-425.000.

Ramsey, Bernard; Christy, Dean A.; Beverly, Richard S.; and Wucher, Jerome M., to Ramtech, Inc. CPU socket supporting socket-to-socket optical communications. 4,953,930, Cl. 350-96.110.

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Ramsey, Bernard; Christy, Dean A.; Beverly, Richard S.; and Wucher, Jerome M., 4,953,930, Cl. 350-96.110.

Randr, Inc.: *See*—
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Ranganathan, Ramachandran: *See*—
Sovak, Milos; and Ranganathan, Ramachandran, 4,954,348, Cl. 424-5.000.

Rankin, Martin D., to Axti Pty Ltd. Electrically heated stuffed toy with concentrated heat dissipation. 4,954,676, Cl. 219-200.000.

Rapoport, Mitchell. Accessory tray. 4,953,716, Cl. 211-107.000.

Raposo, Mark E.: *See*—
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Rapra Technology Limited: *See*—
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Rassool, Reza P.: *See*—
MacDonald, Lindsay; Mayne, Clive; and Rassool, Reza P., 4,954,912, Cl. 358-448.000.

Rauber, Gerhard; and Stechert, Roland, to Boehringer Ingelheim GmbH. Use of oxoquinazoline derivatives in the treatment of hyperuricaemia. 4,954,505, Cl. 514-267.000.

Rauh, Hans-Jurgen, to Agfa-Gevaert Aktiengesellschaft. Method of and apparatus for delivering webs of photosensitive material to a printer. 4,953,805, Cl. 242-58.600.

Ray, Charles D.; and Dickhudt, Eugene A., to Surgical Dynamics, Inc. Framework for supporting surgical instruments at a surgical wound. 4,953,540, Cl. 128-20.000.

Raychem Corporation: *See*—
Jensen, Michael L.; Nolf, Jean-Marie E.; Vantant, Jan; and Mendes, Luiz N., 4,954,670, Cl. 174-92.000.
Jos, Doucet; and Neves, Mendes L., 4,954,213, Cl. 156-49.000.
Smith-Johannsen, Robert; and Walker, Jack M., 4,954,695, Cl. 219-548.000.

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Read, Andrew J.: *See*—
Israelsohn, Cedric; and Read, Andrew J., 4,953,536, Cl. 126-374.000.

Rector, Douglas: *See*—
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Rector, James W., to Western Atlas International, Inc. Method for reducing noise in drill string signals. 4,954,998, Cl. 367-82.000.

Redfield Stephen R.; and Hesselink, Lambertus, to Microelectronics and Computer Technology Corporation. Enhanced nondestructive holographic reconstruction. 4,953,924, Cl. 350-3.640.

Redman, Brian E., to Bell Communications Research, Inc. Method and apparatus for program updating. 4,954,941, Cl. 364-200.000.

Ree, Moonhor; Swanson, Sally A.; Volksen, Willi; and Yoon, Do Y., to International Business Machines Corporation. Fine domain composite films of polyimide mixtures. 4,954,578, Cl. 525-432.000.

Reed, Victoria K. Riding capsule device with control mechanism. 4,953,849, Cl. 272-35.000.

Reekie, Laurence: *See*—
Mears, Robert J.; Reekie, Laurence; Poole, Simon B.; and Payne, David N., 4,955,025, Cl. 372-6.000.

Reel, Jerry R.: *See*—
Cook, C. Edgar; Wani, Mansukh C.; Lee, Y.-W; Reel, Jerry R.; and Rector, Douglas, 4,954,490, Cl. 514-176.000.

Refabert, Jacques, to Corolle S.A. Flexible bodied dolls. 4,954,118, Cl. 446-375.000.

Refurbished Turbine Components Limited: *See*—
Fraser, Michael J., 4,953,776, Cl. 228-119.000.

Regitar Power Tools Co., Ltd.: *See*—
Lai, Motor, 4,953,774, Cl. 227-131.000.

Regner, Rolf; and Scholz, Joachim, to Standard Elektrik Lorenz Aktiengesellschaft. Optical waveguide module with fiber coupling. 4,953,936, Cl. 350-96.170.
Rehage, Gerhard; Staege, Manfred; and Grunkemeier, Hans W., to Gildemeiester Aktiengesellschaft. Machine tool with two workpiece spindles. 4,953,274, Cl. 29-27.00C.
Reid, Lee R., to Texas Instruments Incorporated. Method of forming a three dimensional integrated circuit structure. 4,954,458, Cl. 437-51.000.
Reilly, Bruce J., to Reilly, Bruce John; and Reilly, Joyce Lynette. Adjustment of camber in four wheel drive. 4,953,889, Cl. 280-661.000.
Reilly, Bruce John: *See*—
Reilly, Bruce J., 4,953,889, Cl. 280-661.000.
Reilly, Joyce Lynette: *See*—
Reilly, Bruce J., 4,953,889, Cl. 280-661.000.
Reinhall, Rolf B.; Johansson, Johan G. I.; and Mokvist, Anders V., to Sunds Defibrator Aktiebolag. Apparatus for feeding lignocellulose-containing material through a steam screen into a refiner. 4,954,221, Cl. 162-261.000.
Reiss, Peter F., to Atlas Powder Company. Multi-directional signal transmission in a blast initiation system. 4,953,464, Cl. 102-312.000.
Reist, Walter, to Ferag AG. Method of, and apparatus for, loading a singling installation for printed products. 4,953,843, Cl. 271-3.100.
Reliance Comm/Tec Corporation: *See*—
Siegmund, Gary G., 4,955,053, Cl. 379-253.000.
Remond, Georges: *See*—
Vincent, Michel; Baliarda, Jean; Marchand, Bernard; and Remond, Georges, 4,954,640, Cl. 548-490.000.
Remondino, Paul D., to Windward Products, Inc. Crawl space ventilator system. 4,953,450, Cl. 98-33.100.
Remuzon, Philippe: *See*—
Weber, Abraham; Bouzard, Daniel; Essiz, Munir; Di Cesare, Pierre; Jacquet, Jean-Pierre; and Remuzon, Philippe, 4,954,507, Cl. 514-300.000.
Rendamax BV: *See*—
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Repholz, Kenneth M.; and Kanade, Pradeep G., to Quaker Oats Company, The. Multi-orifice coextrusion apparatus. 4,954,061, Cl. 425-131.100.
Reppekus, Andreas: *See*—
Lobjinski, Manfred; Horn, Michael; and Reppekus, Andreas, 4,955,015, Cl. 370-56.000.
Resch, Carol M., to Lever Brothers Company. Soap compositions of enhanced antimicrobial effectiveness. 4,954,281, Cl. 252-107.000.
Research Development Corporation of Japan: *See*—
Murakami, Mutsuaki; Nishiki, Naomi; Yoshimura, Susumu; and Watanabe, Kazuhiro, 4,954,193, Cl. 156-155.000.
Research Foundation of the State University of New York, The: *See*—
Cabasso, Israel; and Levy, Moshe, 4,954,381, Cl. 428-116.000.
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Cook, C. Edgar; Wani, Mansukh C.; Lee, Y.-W; Reel, Jerry R.; and Rector, Douglas, 4,954,490, Cl. 514-176.000.
Resonex, Inc.: *See*—
Zerhouni, Elias; and Parish, David M., 4,953,554, Cl. 128-653.00A.
Reuchlein, Gunter: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 4,953,354, Cl. 60-517.000.
Reuner, Horst: *See*—
Aigner, Rudolf; Muller, Gunther; Muller, Rainer; and Reuner, Horst, 4,954,646, Cl. 558-31.000.
Reuter, Wolfgang; Debus, Jurgen; and Lehr, Lothar, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Suspension apparatus for control devices, control panels, or the like. 4,953,821, Cl. 248-276.000.
Revankar, Gopal S., to Deere & Company. Method for making composite sintered apex seal material. 4,954,058, Cl. 419-18.000.
Revis, Anthony, to Dow Corning Corporation. Process of curing methylhydrosiloxanes. 4,954,401, Cl. 428-412.000.
Revis, Anthony, to Dow Corning Corporation. Methylhydrosiloxane paper coatings. 4,954,597, Cl. 528-15.000.
Revis, Anthony: *See*—
Lo, Peter Y. K.; and Revis, Anthony, 4,954,269, Cl. 252-86.000.
Rhoades, George D.: *See*—
Lang, Gary D.; Finan, Donald S.; and Rhoades, George D., 4,953,365, Cl. 62-381.000.
Rhone-Poulenc Chimie: *See*—
Cailly, Francinet; and Fabre, Frederic, 4,954,293, Cl. 252-625.000.
Cavezzan, Jacques; and Peignier, Michel, 4,954,539, Cl. 524-27.000.
Desmurs, Jean-Roger; Besson, Bernard; and Jouve, Isabelle, 4,954,662, Cl. 568-779.000.
Rice, Sandra W.: *See*—
Swofford, Howard W.; Rice, Sandra W.; Farrar, Grover L.; and Rudd, David, 4,954,396, Cl. 428-340.000.
Richard, Robert G.: *See*—
Batt, James A.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., 4,954,284, Cl. 252-170.000.
Richardson, Gordon L.; and Richardson, James G. Piggy back evaporating for maple syrup evaporator apparatus or the like. 4,953,538, Cl. 127-9.000.
Richardson, James G.: *See*—
Richardson, Gordon L.; and Richardson, James G., 4,953,538, Cl. 127-9.000.
Richartz, Erich, to Dyckerhoff & Widmann Aktiengesellschaft. Hot-rolled steel bar with helically extending ribs, method of and apparatus for producing the steel bar. 4,953,379, Cl. 72-187.000.
Richmond, James W., to Emhart Industries, Inc. Rattle resistant gear-shift position indicator. 4,953,493, Cl. 116-28.100.
Richmond, James W., to Emhart Industries Inc. Automotive wheel speed sensor assembly with multipole rotor mounted on wheel bearing spindle. 4,954,775, Cl. 324-174.000.
Ricoh Company, Ltd.: *See*—
Koike, Tadao; Noguchi, Koichi; Takahashi, Hiroshi; and Tsunoda, Koichi, 4,954,849, Cl. 355-319.000.
Yamamuro, Tetsu, 4,954,534, Cl. 522-28.000.
Ricon Corporation: *See*—
Paquin, Gregory J., 4,953,665, Cl. 187-9.00R.
Ridings, James, to Strato-Lift,Inc. Elevating apparatus having an offset upper boom maintaining a workstation level on a cantilevered angularly movable support that retracts into a compact position. 4,953,666, Cl. 187-9.00R.
Rieck, James N.: *See*—
Rains, Randall C.; Dormish, Jeffrey F.; Stanton, Susan A.; and Rieck, James N., 4,954,199, Cl. 156-331.700.
Riefler, R. Scott; and Powers, John W., to American Cyanamid Company. Interleaf layer in fiber reinforced resin laminate composites. 4,954,382, Cl. 428-116.000.
Rieter Machine Works Ltd.: *See*—
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, 4,953,802, Cl. 242-46.200.
Right, Robert W.; and Carter, Simon T., to General Signal Corporation. Continuity-isolation testing for class A wiring in fire alarm system. 4,954,809, Cl. 340-516.000.
Rigsby, Bill B. Golfer's training aid. 4,953,867, Cl. 273-183.00D.
Riley, Gilbert N.; Holodnak, Richard S.; Malin, Richard A.; and Muller, Arno, to Pitney Bowes Inc. Printwheel setting device for a postage meter. 4,953,996, Cl. 400-162.200.
Rimkeit, Eugene; and Schomburg, Richard. Apparatus and method for equalizing a soundfield. 4,955,058, Cl. 381-103.000.
Rimland, Bernard: *See*—
Rosen, Fred; and Rimland, Bernard, 4,953,562, Cl. 128-771.000.
Ripka, Bernd: *See*—
Rother, Dietrich; Ripka, Bernd; and Berger, Rainer, 4,955,039, Cl. 375-75.000.
Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Reuter, Wolfgang; Debus, Jurgen; and Lehr, Lothar, 4,953,821, Cl. 248-276.000.
Rivers, Joseph L., to Randr, Inc. Golf club grip cleaner. 4,953,999, Cl. 401-9.000.
Robb, James R., to Rockwell International Corporation. Memory device wherein a shadow register corresponds to each memory cell. 4,954,988, Cl. 365-189.020.
Robert Bosch GmbH: *See*—
Alberter, Gunther; Deeg, Helmut; Hettich, Gerhard; Neidhard, Klaus; Schmid, Hans-Dieter; and Schrumpf, Hans, 4,954,677, Cl. 200-834.000.
Crispin, Norbert; Schumacher, Hartmut; Vogt, Harald; and Eisenbarth, Rudolf, 4,953,277, Cl. 29-407.000.
Robertson, Frederick K.: *See*—
Graff, James C.; and Robertson, Frederick K., 4,953,718, Cl. 211-123.000.
Robinson, Ken K. Granulated activated carbon for water treatment. 4,954,469, Cl. 502-80.000.
Robinson, Raymond S.: *See*—
Kaufman, Harold R.; and Robinson, Raymond S., 4,954,751, Cl. 315-111.810.
Robinson, S. Eric. Livestock watering apparatus. 4,953,507, Cl. 119-73.000.
Robotic Vision Systems, Inc.: *See*—
Lee, Jay; and Mauro, Alex, 4,954,059, Cl. 425-72.100.
Rock, Erich, to Julius Blum Gesellschaft m.b.H. Pull-out guide assembly for drawers. 4,953,991, Cl. 384-19.000.
Rocke, James A.: *See*—
Johnson, John M.; Rocke, James A.; and Udupa, Divakara K. R., 4,954,965, Cl. 364-514.000.
Rockwell-Collins France: *See*—
Lanciaux, Jacques, 4,954,835, Cl. 342-418.000.
Rockwell International Corporation: *See*—
Alexander, Jack L., Sr., 4,954,148, Cl. 55-223.000.
Ewbank, Mark D.; Chang, Tallis Y.; and Feinberg, Jack L., 4,953,954, Cl. 350-354.000.
Robb, James R., 4,954,988, Cl. 365-189.020.
Trozpek, Ludd A., 4,954,700, Cl. 250-201.900.
Rodbell, Kenneth P.: *See*—
Carr, Jeffrey W.; David, Lawrence D.; Guthrie, William L.; Kaufman, Frank B.; Patrick, William J.; Rodbell, Kenneth P.; Pasco, Robert W.; and Nenadic, Anton, 4,954,142, Cl. 51-309.000.
Roddy, Jim H.: *See*—
Ross, Richard J.; and Roddy, Jim H., 4,953,617, Cl. 166-187.000.
Rogala, Stanely J.: *See*—
Taylor, Sidney A.; and Rogala, Stanely J., 4,953,496, Cl. 118-72.000.
Rogers, H. David: *See*—
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, 4,953,300, Cl. 38-36.000.
Rogers, Steven A.; Bockelmann, George; and Hester, Gary, to Cryptek, Inc. Self-aligning print head assembly with advanced shielding characteristics. 4,954,839, Cl. 346-76.0PH.
Rogge, Doug: *See*—
Crawford, Danny E.; and Rogge, Doug, 4,954,025, Cl. 408-238.000.

Rohm and Haas Company: *See*—
Hallden-Abberton, Michael P.; Bortnick, Newman M.; Cohen, Leslie A.; Freed, William T.; and Fromuth, Harry C., 4,954,574, Cl. 525-327.600.
Kelly, Martha J., 4,954,655, Cl. 564-464.000.
Mattox, John R., 4,954,338, Cl. 424-78.000.
Rohm Pharma GmbH: *See*—
Muller, Josef, 4,954,345, Cl. 424-450.000.
Rokach, Joshua: *See*—
Young, Robert N.; Rokach, Joshua; and Hayes, Edward C., 4,954,638, Cl. 548-546.000.
Rokos, George H. S., to STC PLC. Integrated circuits. 4,954,865, Cl. 357-43.000.
Rolf, Ryham: *See*—
Erkki, Kiiskila; and Rolf, Ryham, 4,953,607, Cl. 159-13.300.
Rollini, Pietro; and Luisi, Domenic, to Rubinet Brass Canada Limited. Tub transfer-diverter valve with built-in vacuum breaker and backflow prevenster. 4,953,585, Cl. 137-218.000.
Romaine, Richard A. Display device for vehicles. 4,953,315, Cl. 40-593.000.
Romann, Brigitte: *See*—
Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, 4,954,961, Cl. 364-484.000.
Romano, Ugo: *See*—
Belluzzi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,954,653, Cl. 564-223.000.
Rometsch, Rainer: *See*—
Frankenreiter, Michael; Rometsch, Rainer; and Seher, Jens-Peter, 4,953,557, Cl. 128-677.000.
Roos, Sture G., to Telefonaktiebolaget L M Ericsson. Matrix crosspoint switching device. 4,954,674, Cl. 200-175.000.
Rorer Pharmaceutical Corporation: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Faith, William C., 4,954,494, Cl. 514-210.000.
Rosario-Jansen, Theresa; and Lichtenwalter, Glen D., to Procter & Gamble Company, The. Process for preparing quaternized imidazoline fabric conditioning compounds. 4,954,635, Cl. 548-354.000.
Rosch, Wilhelm. Hinged multiple garment hanger. 4,953,717, Cl. 211-113.000.
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D. Method and apparatus for aiding in the reduction of incidence of tobacco smoking. 4,953,572, Cl. 131-270.000.
Rose, Karce D.: *See*—
Rose, Jed E.; Jarvik, Murray E.; and Rose, Karce D., 4,953,572, Cl. 131-270.000.
Rosen, Fred; and Rimland, Bernard. Method of urine specimen identification. 4,953,562, Cl. 128-771.000.
Rosen, Robert A.: *See*—
Krikorian, Kapriel V.; Rosen, Robert A.; and Li, Frank K., 4,954,830, Cl. 342-137.000.
Rosenberg, Jeffrey S.; and Lockyear, Kevin W., to T. D. Williamson, Inc. Pipeline caliper pig. 4,953,412, Cl. 73-865.800.
Rosenberger, Siegfried; and Schwarzenbach, Kurt, to Ciba-Geigy Corporation. Use of phenol-mercaptocarboxylic acid esters as stabilizers for lubricants. 4,954,275, Cl. 252-48.600.
Rosinski, Edward J.: *See*—
Kuehl, Guenter H.; and Rosinski, Edward J., 4,954,243, Cl. 208-120.000.
Ross, Richard J.; and Roddy, Jim H., to Baker Hughes Incorporated. Apparatus for setting and retrieving a bridge plug from a subterranean well. 4,953,617, Cl. 166-187.000.
Ross, Thomas H. Postcard with personal photograph. 4,953,780, Cl. 229-92.800.
Rothenpieler, Manfred; and Moos, Wolfgang, to SMS Schloemann-Siemag Aktiengeselschaft. Winding reel for rolled strip. 4,953,806, Cl. 242-72.100.
Rother, Dietrich; Ripka, Bernd; and Berger, Rainer, to Alcatel N.V. Quadrature receiver. 4,955,039, Cl. 375-75.000.
Rothman, Isaac: *See*—
Degen, Peter J.; Rothman, Isaac; and Gsell, Thomas C., 4,954,256, Cl. 210-490.000.
Rothmans, Benson & Hedges Inc.: *See*—
Brackmann, Warren A.; Snaidr, Stanislav M.; Nehyo, Takeshi; and Sheahan, Michael H., 4,953,570, Cl. 131-109.100.
Rothmans International Services Limited: *See*—
Brackmann, Warren A.; Snaidr, Stanislav M.; Nehyo, Takeshi; and Sheahan, Michael H., 4,953,570, Cl. 131-109.100.
Round, Winslow G.: *See*—
Connerney, William R.; Raposo, Mark E.; Round, Winslow G.; and Pavio, Raymond T., 4,955,079, Cl. 455-325.000.
Roussel Bio Corporation: *See*—
Evans, William E., 4,953,792, Cl. 239-654.000.
Rowlett, James R., Jr., to Rowlett, James R., Jr. Medication dispensing apparatus. 4,953,745, Cl. 221-5.000.
Royce Medical Company: *See*—
Grim, Tracy E.; and Haines, Jeffrey R., 4,953,543, Cl. 128-80.00C.
Royer, Daniel R.: *See*—
Dieulesaint, Eugene J.; Royer, Daniel R.; and Legras, Olivier R., 4,954,997, Cl. 367-13.000.
Rozen, Shlomo: *See*—
Lerman, Ori; and Rozen, Shlomo, 4,954,648, Cl. 558-425.000.
RTR Oil Sands (Alberta) Ltd.: *See*—
Corti, Aldo; and Falcon, John A., 4,954,254, Cl. 210-209.000.
Rubbo, Richard P.: *See*—
Lehr, Douglas J.; Bell, Merle L.; Rubbo, Richard P.; and Forehand, Richard L., 4,953,622, Cl. 166-327.000.
Rubin, Henri, to Commodore-Amiga, Inc. Universal connector device for bus networks in host computer/co-processor computer system. 4,954,949, Cl. 364-200.000.
Rubin, Mae K.; and Chu, Pochen, to Mobil Oil Corp. Composition of synthetic porous crystalline material, its synthesis and use. 4,954,325, Cl. 423-328.000.
Rubinet Brass Canada Limited: *See*—
Rollini, Pietro; and Luisi, Domenic, 4,953,585, Cl. 137-218.000.
Rubino, John. Hand-spinnable top and kit therefor. 4,954,116, Cl. 446-256.000.
Ruchel, James E. Nonfreezing fishing apparatus. 4,953,317, Cl. 43-17.000.
Ruchel, Peter: *See*—
Gaag, Norbert; and Ruchel, Peter, 4,954,187, Cl. 148-413.000.
Rudd, David: *See*—
Swofford, Howard W.; Rice, Sandra W.; Farrar, Grover L.; and Rudd, David, 4,954,396, Cl. 428-340.000.
Ruddock, John C.: *See*—
Maeda, Hiroshi; Tone, Junsuke; Ruddock, John C.; and Holdom, Kelvin S., 4,954,482, Cl. 514-8.000.
Rude, Robert X.: *See*—
Wiegand, Karl E.; and Rude, Robert K., 4,954,448, Cl. 435-232.000.
Rudenauer, Werner: *See*—
Postler, Gunter; Bock, Erich; von Estress-Fursteneck, Wolfgang; and Rudenauer, Werner, 4,953,813, Cl. 244-147.000.
Ruehl, William E., to Illinois Tool Works, Inc. Ground start key switch. 4,954,672, Cl. 200-51.090.
Ruggiero, Paolo; and Petracca, Roberto, to Sclavo S.p.A. Method for the immunolocalization of antigens with the use of antibodies directed against epitopes of non-glucidic nature. 4,954,433, Cl. 435-7.000.
Rulke, Gerhart, to Inventio AG. Balustrade for a transportation apparatus especially an escalator or a passenger walkway. 4,953,686, Cl. 198-332.000.
Rumbaugh, Duane M.: *See*—
Savage-Rumbaugh, E. Sue; Rumbaugh, Duane M.; Smith, Samuel O.; and Smith, Michael B., 4,953,500, Cl. 119-17.000.
Rushmere, John D., to Du Pont de Nemours, E. I., and Company. Polysilicate microgels as retention/drainage aids in papermaking. 4,954,220, Cl. 162-168.300.
Rusk, George R., to Xcel Corporation (Computron Display Systems Division). Power source circuit. 4,954,758, Cl. 315-411.000.
Russell, John C.: *See*—
Yost, David A.; Russell, John C.; and Yang, Heechung, 4,954,452, Cl. 436-524.000.
Ryoichi, Takahashi: *See*—
Shoji, Takeuchi; Katsuyoshi, Iino; and Ryoichi, Takahashi, 4,953,362, Cl. 62-246.000.
Ryrko, Bruno: *See*—
Ebert, Wolfram; Handrich, Eberhard; Hafen, Martin; and Ryrko, Bruno, 4,953,834, Cl. 267-160.000.
Rys, Karla J.; Greene, Alan P.; Osmer, Frederick S.; and Podgorsky, Joseph J., to Lever Brothers Company. Acyl isethionate skin cleansing compositions. 4,954,282, Cl. 252-117.000.
Rzechula, Michael J., to Slick Ice Limited. Additive for treating water used to form ice. 4,953,360, Cl. 62-66.000.
S. A. Day Manufacturing Co., Inc.: *See*—
Conn, Paul J., 4,954,184, Cl. 148-24.000.
S. C. Johnson & Son, Inc.: *See*—
Tsaur, Sheng-Liang, 4,954,558, Cl. 525-460.000.
S.F. Muller & Partner: *See*—
Muller, Roger; and Bee, Giancarlo, 4,954,255, Cl. 210-437.000.
SAB Nife AB: *See*—
Severinsson, Lars M., 4,953,669, Cl. 188-171.000.
SAB Nordic AB: *See*—
Severinsson, Lars M., 4,953,668, Cl. 188-158.000.
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased (by Halpern, Marjorie A., administratrix), to Eurceltique S.A. Method of producing standardized povidone iodine preparations and such preparations. 4,954,351, Cl. 424-667.000.
Sackler, Raymond R.: *See*—
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.
Sackler, Richard S.: *See*—
Sackler, Mortimer D.; Miller, Ronald B.; Pinter, Erwig O.; Rackur, Helmut E. W.; Sackler, Raymond R.; Sackler, Richard S.; and Halpern, Alfred, deceased, 4,954,351, Cl. 424-667.000.
Sacripante, Guerino: *See*—
Breton, Marcel P.; Deslandes, Yves; and Sacripante, Guerino, 4,954,412, Cl. 430-137.000.
Saeki, Junichi; Kaneda, Aizo; and Nishi, Kunihiko, to Hitachi, Ltd. Transfer molding process and an apparatus for the same. 4,954,301, Cl. 264-40.100.
Saeki, Yukihiro; and Nakamura, Toshimasa, to Kabushiki Kaisha Toshiba. Semiconductor memory with p-channel load transistor. 4,954,991, Cl. 365-189.010.
Safety by Design, Inc.: *See*—
August, Alfred A., Sr.; and Jackson, Anthony M., 4,954,813, Cl. 340-571.000.
Saftron, Inc.: *See*—
Weaver, James R., III, 4,953,830, Cl. 256-65.000.

Saida, Yoshihiro: *See*—
Yoshida, Haruo; Uotani, Nobuo; and Saida, Yoshihiro, 4,954,590, Cl. 526-259.000.

Saijo, Yasutsugu: *See*—
Yano, Kanji; Saijo, Yasutsugu; Kusaka, Kensaku; and Hirabayashi, Hiromitsu, 4,954,845, Cl. 355-290.000.

Saint-Gobain Vitrage: *See*—
Jamet, Bernard, 4,954,306, Cl. 264-210.200.

Saito, Horiyuki: *See*—
Matsumoto, Yukio; Saito, Horiyuki; and Morita, Kuniki, 4,953,835, Cl. 267-180.000.

Saito, Kenji: *See*—
Nakayama, Yoshiaki; Saito, Kenji; and Kawada, Yukihiro, 4,954,884, Cl. 358-29.000.

Saito, Takayoshi: *See*—
Tsujimura, Osamu; Arai, Tatsuo; and Saito, Takayoshi, 4,954,021, Cl. 407-35.000.

Saito, Yoshimasa: *See*—
Kotani, Terumitsu; Taka, Toshio; and Saito, Yoshimasa, 4,954,391, Cl. 428-220.000.

Saitoh, Keishi: *See*—
Hashizume, Junichiro; Takei, Tetsuya; Iida, Shigehira; Saitoh, Keishi; and Arai, Takayoshi, 4,953,498, Cl. 118-719.000.

Sakai, Tokuji: *See*—
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Sakairi, Tadashi: *See*—
Ishii, Kazunori; Terakado, Seishi; Funakoshi, Yasutomo; and Sakairi, Tadashi, 4,954,696, Cl. 219-548.000.

Sakamoto, Fumio: *See*—
Maegawa, Mamoru; and Sakamoto, Fumio, 4,954,930, Cl. 362-26.000.

Sakamoto, Kiichi; Yasuda, Hiroshi; Yamada, Akio; and Kudou, Jinko, to Fujitsu Limited. Photoelectron mask and photo cathode image projection method using the same. 4,954,717, Cl. 250-492.300.

Sakamoto, Toshihiro: *See*—
Kawamoto, Tetsuo; Motohashi, Ryo; Sakamoto, Toshihiro; Suzuki, Yasuo; and Abe, Hideaki, 4,954,736, Cl. 316-156.000.

Sakamoto, Yoshio: *See*—
Aoki, Kazutsugu; Fuse, Noboru; and Sakamoto, Yoshio, 4,954,684, Cl. 219-390.000.

Sakata, Toichi: *See*—
Nomura, Yoshihiro; Hanabusa, Kazuhito; Minamisawa, Hiroshi; Morinaga, Takashi; Sakata, Toichi; Mukoyama, Yoshiyuki; Nishizawa, Hiroshi; and Miyajima, Hiromu, 4,954,612, Cl. 528-353.000.

Sakaya, Masuji; Okisi, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, to Fujikura Ltd. Heat pipe and method of manufacturing the same. 4,953,632, Cl. 165-104.260.

Sakayori, Hiroyuki: *See*—
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,954,217, Cl. 156-643.000.

Sakemi, Yuji: *See*—
Inoue, Masahiro; Tajima, Hatsuo; Sakemi, Yuji; and Okado, Kenji, 4,954,404, Cl. 430-45.000.

Sakito, Yoji: *See*—
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,954,651, Cl. 562-856.000.

Sakiyama, Masayuki: *See*—
Nishiyama, Yukio; Fujioka, Junzo; Hino, Haruki; Matsuzaki, Yuji; Sakiyama, Masayuki; and Yokoyama, Minoru, 4,954,314, Cl. 419-45.000.

Sako, Ryohsuke; Hasebe, Akihiko; Nishihara, Akira; and Okita, Hiroshi, to Nihon Parkerizing Co., Ltd. Metal surface hydrophilicizing process and composition. 4,954,372, Cl. 427-388.200.

Sako, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for resetting appliance. 4,954,668, Cl. 200-314.000.

Sakuma, Susumu. Follow-up system for moving bodies. 4,954,836, Cl. 342-450.000.

Sakura Color Products Corporation: *See*—
Imagawa, Kiyotaka, 4,954,174, Cl. 106-27.000.

Sakurada, Ichio: *See*—
Takajo, Shigeaki; Furukimi, Osamu; Ogura, Kuniaki; Maruta, Keiichi; Abe, Teruyoshi; and Sakurada, Ichio, 4,954,171, Cl. 75-246.000.

Sakurai, Hiromi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Wheel presetting apparatus. 4,953,288, Cl. 29-704.000.

Sakurai, Kenichi; and Takano, Yoshihide, to Yamaha Hatsudoki Kabushiki Kaisha. Cooling system for V type engine. 4,953,525, Cl. 123-41.280.

Sakurai, Masao: *See*—
Tatee, Tochiro; Takahira, Takashi; Yamashita, Kouwa; Sakurai, Masao; Shiozawa, Akira; and Narita, Kazuhisa, 4,954,642, Cl. 549-389.000.

Salerno, Jorge A., to Consiglio Nazionale Delle Ricerche. Catheter for endocardial biopsy, which can also be used for identifying the point of origin of ventricular arrhythmia. 4,953,559, Cl. 128-751.000.

Salisbury, Richard, to Blodgett & Blodgett. Article coating system. 4,953,495, Cl. 118-70.000.

Salmela, Gordon O.; and Pizzarella, Michael L., to Raytheon Company. Counterbalance mechanism. 4,953,256, Cl. 16-1.00C.

Salomon S.A.: *See*—
Diard, Jean-Luc; and Guers, Francois, 4,953,884, Cl. 280-609.000.

Salzer, Donald E.; and Maassen, Nevil Q., to Santa Barbara Research Center. Low distortion focal plane platform. 4,954,708, Cl. 250-352.000.

Salzmann, Ferdinand F.: *See*—
Wenkman, Gregory J.; and Salzmann, Ferdinand F., 4,953,747, Cl. 221-45.000.

Samann, Heinz, to Haarkosmetik and Parfumerien. Carton pad. 4,954,385, Cl. 428-131.000.

Sampsell, Jeffrey B., to Texas Instruments Incorporated. Spatial light modulator. 4,954,789, Cl. 330-4.300.

SamSung Electronic Co., Ltd.: *See*—
Kim, Jung-Soo, 4,954,764, Cl. 318-798.000.

Samsung Electronics Co., Ltd.: *See*—
Choi, Young H., 4,954,795, Cl. 333-194.000.
Lee, Shin H., 4,953,364, Cl. 62-285.000.
Park, Han-su, 4,954,927, Cl. 361-328.000.

Samuels, Bernard. Apparatus, method, and test kit for diagnosis of vaginal yeast infections. 4,953,560, Cl. 128-759.000.

Sanden Corporation: *See*—
Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, 4,954,050, Cl. 417-269.000.
Kokubun, Yoshikazu; Kurosawa, Akihito; Ushikubo, Kohei; and Todokoro, Shinji, 4,954,697, Cl. 235-381.000.
Shoji, Takeuchi; Katsuyoshi, Iino; and Ryoichi, Takahashi, 4,953,362, Cl. 62-246.000.

Sander, Hans J.: *See*—
Abeler, Gerd; and Sander, Hans J., 4,954,546, Cl. 524-180.000.

Sander, Wendell B.: *See*—
Twitty, William B.; and Sander, Wendell B., 4,955,018, Cl. 370-85.100.

Sanders, Daniel T. Feed bowl for animals. 4,953,506, Cl. 119-61.000.

Sanders, Raymond H., to Unico, Inc. Transfer mechanism for conveyor. 4,954,033, Cl. 414-27.000.

Sandoz Ltd.: *See*—
Oppliger, Max, 4,954,133, Cl. 8-681.000.
Prager, Bernhard C., 4,954,624, Cl. 540-225.000.

Sands, Robert E., to Mueller Co. Dual check valve. 4,953,588, Cl. 137-512.300.

Sanken Electric Co., Ltd.: *See*—
Yokoyama, Takaaki, 4,954,307, Cl. 264-272.150.

Sanns, Frank, Jr., to Mobay Corporation. Internal mold release agent for use in polyurea rim systems. 4,954,537, Cl. 521-157.000.

Sano, Hirohisa: *See*—
Imoto, Katsuyuki; Sano, Hirohisa; Miyazaki, Masaru; Matsuoka, Naoyuki; and Uetsuka, Hisato, 4,953,934, Cl. 350-96.150.

Sano, Yasuro; Orii, Akira; and Murakami, Eiji. Electronic zigzag sewing machine. 4,953,486, Cl. 112-447.000.

Sanraku Incorporated: *See*—
Yoshimoto, Akihiro; Jodo, Osamu; Watanabe, Yoshio; Okamoto, Rokuro; and Takeuchi, Tomio, 4,954,438, Cl. 435-78.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Sumigawa, Yukio, 4,954,107, Cl. 440-61.000.

Santa Barbara Research Center: *See*—
Salzer, Donald E.; and Maassen, Nevil Q., 4,954,708, Cl. 250-352.000.

Sanyo Electric Co., Ltd.: *See*—
Sugayama, Sakae, 4,955,073, Cl. 455-161.000.
Sugayama, Sakae, 4,955,077, Cl. 455-197.000.
Urakami, Toyozo, 4,954,893, Cl. 358-148.000.

Sanyo Kiki Kabushiki Kaisha: *See*—
Takahashi, Hiroyuki; and Kurashima, Toshiaki, 4,953,592, Cl. 137-599.100.

Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Yoshioka, Hidetoshi; Kojima, Eiji; Ishida, Shuji; Yoshioka, Hiroyuki; and Murakami, Kunichika, 4,954,485, Cl. 514-49.000.

Saotome, Yoshimi; Kuchiki, Kiyotsuna; and Katada, Tsuyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for suppressing quaky movements of mobile cranes. 4,953,723, Cl. 212-159.000.

Saratoga Spa & Bath Company: *See*—
Gardenier, John, 4,953,240, Cl. 4-542.000.

Sare, Ian R.; Henderson, Ian; Heijkoop, Teunis; Bosworth, Michael R.; Aspin, Ronald E.; and Arnold, Brian K., to Commonwealth Scientific & Industrial Research Organization; and Vida-Weld Pty. Limited. Composite metal articles. 4,953,612, Cl. 164-102.000.

Sarkoezi, Imre, to Siemens Aktiengesellschaft. Method and apparatus for generating a correction signal in a digital clock recovery device. 4,955,040, Cl. 375-119.000.

Sarrine, Robert J.; Garsee, Henry A.; Kelley, Charles D.; and Guadagno, Philip A., to Helena Laboratories. Automatic electrophoresis apparatus. 4,954,237, Cl. 204-299.00R.

Sarugaku, Shinichi: *See*—
Miyake, Norihisa; Sumita, Masaki; and Sarugaku, Shinichi, 4,954,762, Cl. 318-568.190.

Sasaki, Akira; Esaki, Seiji; Hashimoto, Yasushi; and Kurita, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Sliding universal joint having cylindrical holder positioning means. 4,954,119, Cl. 464-111.000.

Sasaki Electric Corporation: *See*—
Kawabata, Masaaki; and Kawashima, Tokio, 4,954,936, Cl. 362-249.000.

Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, to Mitsubishi Rayon Company, Limited. Methacrylimide containing polymer. 4,954,575, Cl. 525-330.500.

Sasaki, Kazuya, to Fujitsu Limited. Optical fiber cable and method of making the same. 4,953,942, Cl. 350-96.230.

Sasaki, Masahiro; Abe, Osamu; and Ishikawa, Hideaki, to Hitachi, Ltd.; and Hitachi Automotive Engineering, Inc. Engine control apparatus. 4,953,513, Cl. 123-489.000.

Sato, Akira: *See*—
Tsurumi, Kazunori; Nakamura, Toshihide; and Sato, Akira, 4,954,474, Cl. 502-185.000.
Sato, Chosuke: *See*—
Kawai, Yoshikazu; Sato, Chosuke; and Kato, Masaru, 4,953,649, Cl. 180-79.100.
Sato, Kaoru: *See*—
Kumagai, Hiromi; Sato, Kaoru; and Imai, Yoshio, 4,954,685, Cl. 319-390.000.
Sato, Kazuo: *See*—
Kawamura, Kazuhiko; and Sato, Kazuo, 4,953,605, Cl. 152-541.000.
Sato, Koji: *See*—
Nagaoka, Shinji; Kawai, Michio; and Sato, Koji, 4,954,861, Cl. 354-403.000.
Sato, Masaaki, to Olympus Optical Co., Ltd. Dictating apparatus which is remotely controlled utilizing a push-button telephone. 4,955,051, Cl. 379-75.000.
Sato, Mitsuhiko: *See*—
Okamura, Kiyohito; Sato, Mitsuhiko; Hasegawa, Yoshio; Seguchi, Tadao; and Kawanishi, Shunichi, 4,954,461, Cl. 501-95.000.
Sato, Ryo: *See*—
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,954,626, Cl. 544-105.000.
Sato, Ryuji: *See*—
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Sato, Toshiaki: *See*—
Suzuki, Fumio; Iwasawa, Yoshihiro; Sato, Toshiaki; Ikai, Takasi; and Oguti, Tosihiko, 4,954,164, Cl. 71-92.000.
Sato, Yoshikazu; Watabe, Hiroomi; Ishii, Shigetaka; Nakazawa, Tadashi; Shomura, Takashi; Sezaki, Masaji; and Kondo, Shinichi, to Meiji Seika Kaisha, Ltd. Novel antitumor antibiotic substance and a method for production thereof. 4,954,641, Cl. 549-384.000.
Satoh, Kazuhiko: *See*—
Ohmi, Tadahiro; Kanno, Yohichi; Satoh, Kazuhiko; and Hatayama, Tadahiro, 4,953,826, Cl. 251-331.000.
Satoh, Kenji: *See*—
Furuhata, Takashi; and Satoh, Kenji, 4,954,902, Cl. 360-10.200.
Satou, Hiroshi; Utsui, Yoshihiko; Tuneyoshi, Kiyotugu; Taniguchi, Takashi; Haraga, Kousuke; and Tsukui, Keitarou, to Mitsubishi Denki Kabushiki Kaisha. Method for manufacture stress detector. 4,954,215, Cl. 156-630.000.
Sattinger, Stanley S.; Lu, Leo K. H.; and Smerecky, Jerry R., to Westinghouse Electric Corp. Vibration damping apparatus. 4,954,375, Cl. 428-34.100.
Sauer-Sundstrand Company: *See*—
Johnson, Alan W., 4,953,426, Cl. 74-606.00R.
Sauerbier, Charles E.; and Lochtefeld, Thomas J., to Lochtefeld, Thomas J. Surfing-wave generators. 4,954,014, Cl. 405-79.000.
Saunders, Kenwyn D.: *See*—
Butterworth, Robert M.; and Saunders, Kenwyn D., 4,954,270, Cl. 252-8.800.
Savage, Charles; Barone, Frank G., Jr.; Demetrious, Gregory; and Volpe, Vincent, to Hacowie Corporation. Directional information system. 4,954,958, Cl. 364-444.000.
Savage-Rumbaugh, E. Sue; Rumbaugh, Duane M.; Smith, Samuel O.; and Smith, Michael B., to Emory University. Door system for large primate caging. 4,953,500, Cl. 119-17.000.
Sawaki, Ippei: *See*—
Fukuhima, Nobuhiro; and Sawaki, Ippei, 4,955,006, Cl. 369-13.000.
Sawyer, Philip N.; and Freeman, Leon D. Methods for administering anti-thrombotic compounds. 4,954,521, Cl. 514-474.000.
Sayles, David C. Siloxane-based elastomeric interceptor motor insulation. 4,953,476, Cl. 102-289.000.
Sayo, Noboru; Takemasa, Toshiro; and Kumobayashi, Hidenori, to Takasago International Corporation. Ruthenium-phosphine complex. 4,954,644, Cl. 556-14.000.
Sbragia, Frank J. Collapsible cart. 4,953,878, Cl. 280-30.000.
Scerbak, David G., to Electro-Optics Technology, Inc. Planar solid state laser resonator. 4,955,034, Cl. 372-94.000.
Schaaf, Hanno: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiesal, Gerhard, 4,953,354, Cl. 60-517.000.
Schabert, Hans-Peter; Strickroth, Erich; and Laurer, Erwin, to Siemens Aktiengesellschaft; and Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Bolted pipe joint releasable by remote control and combination tool therefor. 4,953,580, Cl. 285-23.000.
Schafer, Klaus: *See*—
Marchewka, Werner; Rackebrandt, Karl-Heinz; Schafer, Klaus; and Seebode, Albert, 4,953,409, Cl. 73-861.170.
Scharf, Rolf: *See*—
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Schaub, Norbert: *See*—
Schober, Karl; and Schaub, Norbert, 4,953,391, Cl. 73-117.000.
Schaudt Maschinenbau GmbH: *See*—
Vetter, Ulrich, 4,953,522, Cl. 125-11.010.
Scheel, Michael D.: *See*—
Griffith, Glenn E.; Bustamante, Joaquin; Scheel, Michael D.; and Koven, Herbert, 4,953,777, Cl. 228-119.000.
Scheinhutte, Hans-Jurgen, to Gebruder Loepfe AG. Device for detecting neps in carded, textile fiber material. 4,953,265, Cl. 19-297.000.
Schenfele, Robert D.: *See*—
Lewis, David F.; and Schenfele, Robert D., 4,954,428, Cl. 430-495.000.
Lewis, David F.; and Schenfele, Robert D., 4,954,543, Cl. 524-104.000.
Schenker, Gilbert: *See*—
Schmid, Karl H.; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Scharf, Rolf, 4,954,283, Cl. 252-135.000.
Schering Aktiengesellschaft: *See*—
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Mannesmann, Gerda; Schillinger, Ekkehard; and Town, Michael H., 4,954,524, Cl. 514-530.000.
Schickaneder, Helmut: *See*—
Herter, Rolf; Morsdorf, Peter; Pfahlert, Volker; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 4,954,501, Cl. 514-252.000.
Schiefer, Erich J.: *See*—
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Schiessl, Gerhard: *See*—
Erber, Anton; Hoff, Heinz; Reuchlein, Gunter; Schaaf, Hanno; and Schiessl, Gerhard, 4,953,354, Cl. 60-517.000.
Schiessl, Henry W.; and Manke, Steven A., to Olin Corporation. Process for minimizing residual hydrazine in polymer latices. 4,954,614, Cl. 528-483.000.
Schillinger, Ekkehard: *See*—
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Mannesmann, Gerda; Schillinger, Ekkehard; and Town, Michael H., 4,954,524, Cl. 514-530.000.
Schindler, Guenter: *See*—
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Schivley, George P., Jr.: *See*—
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Schlaeger, Gary W.: *See*—
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Schlegel, Hans: *See*—
Dunwald, Willi; Schlegel, Hans; Halpaap, Reinhard; and Pedain, Josef, 4,954,577, Cl. 525-420.000.
Schleifstein, Robert A.; and Khuddus, Mohammed A., to Ethyl Corporation. Halogen-containing organometallic compounds. 4,954,551, Cl. 524-327.000.
Schlenker, Theodore R., to Dana Corporation. Ball screw return system. 4,953,419, Cl. 74-459.000.
Schliebs, Gunter: *See*—
Gaus, Harry; Gross, Hagen; and Schliebs, Gunter, 4,954,922, Cl. 361-42.000.
Schloeglmann, Kurt: *See*—
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Schlumberger Technology Corp.: *See*—
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Schmalix, Charles K.: *See*—
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Schmid, Hans-Dieter: *See*—
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Schmid, Heinz: *See*—
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Schmid, Karl H.; Meffert, Alfred; Schenker, Gilbert; Asbeck, Adolf; and Scharf, Rolf, to Henkel Kommanditgesellschaft auf Aktien. Polyethylene glycol ether low temperature foam suppressing agents in low-foam cleaning agents. 4,954,283, Cl. 252-135.000.
Schmidt, Albert L.: *See*—
Sherwin, Gary W.; Hanes, Lewis F.; and Schmidt, Albert L., 4,953,968, Cl. 351-211.000.
Schmidt, Hans, to Siemens Aktiengesellschaft. Connectible switching device. 4,954,671, Cl. 200-50.00C.
Schmidt, Kurt; and Waloszyk, Detlef, to Boge AG. Hydraulically damping elastic bearing. 4,953,833, Cl. 267-140.100.
Schmidt, Steven L.: *See*—
Krishnakumar, Suppayan M.; Nahill, Thomas E.; Schmidt, Steven L.; and Collette, Wayne N., 4,954,376, Cl. 428-35.700.
Schmidt, Susanne: *See*—
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Schmidt, William J., to Vernay Laboratories, Inc. Metering valve for dispensing aerosols. 4,953,759, Cl. 222-402.200.
Schmidt, William L.: *See*—
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Schmitt, Gunter: *See*—
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Schmutzler, Matthias: *See*—
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Schnaars, Daniel R. Cone top to flat top fabric transport bag. 4,953,987, Cl. 383-67.000.
Schnatterer, Stefan: *See*—
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Schnitzler, Dieter: *See*—
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Schober, Karl; and Schaub, Norbert, to Daimler-Benz Aktiengesellschaft. Flat-track unit for motor vehicle test beds. 4,953,391, Cl. 73-117.000.
Schoch, Stephen A.: *See*—
Boah, John K.; Cooney, Charles T., Jr.; Schoch, Stephen A.; and Sibley, Howard W., 4,953,511, Cl. 122-18.000.
Schoenhals, Robert C.: *See*—
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Schofield, John D., to Imperial Chemical Industries PLC. Dispersion. 4,954,177, Cl. 106-499.000.
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Schomburg, Richard: *See*—
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Schreck, Daniel J.; and Ehrmann, Ronald G., to Pyle Overseas B.V. Conductor terminating method. 4,953,289, Cl. 29-863.000.
Schroeder, Thaddeus: *See*—
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Schulte Schlagbaum Aktiengesellschaft: *See*—
Eisermann, Armin, 4,953,683, Cl. 194-235.000.
Schultz, Gerald C. Transportation industry game. 4,953,872, Cl. 273-254.000.
Schultz, Roy D.; England, Thomas R.; and Altizer, A. Clark, to Kollmorgen Corporation. Servo motor with high energy product magnets. 4,954,739, Cl. 310-156.000.
Schulz, Gunter; Probst, Frieder; and Guttler, Hermann, to Zinser Textilmaschinen GmbH. Funnel for a funnel spinning apparatus on a textile machine. 4,953,350, Cl. 57-354.000.
Schumacher, Hartmut: *See*—
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Schumers, Werner, to Thyssen Edelstahlwerke AG. Lifting device on a continuous casting mold. 4,953,613, Cl. 164-416.000.
Schunter, Roland: *See*—
Kohl, Albert; and Schunter, Roland, 4,953,254, Cl. 15-320.000.
Schurch, Samuel, to University of Calgary. Captive bubble surface tensiometer. 4,953,389, Cl. 73-64.400.
Schurter, Robert M.: *See*—
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Houle, Timothy H.; and Schurter, Robert M., 4,954,233, Cl. 204-197.000.
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Schuster, Gary B.: *See*—
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Schwank, Johannes: *See*—
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Schwarzenbach, Kurt: *See*—
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Schwee, Leonard J.: *See*—
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Schweizerische Eidgenossenschaft: *See*—
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Lattanzi, Filippo; and Vanni, Riccardo, 4,954,342, Cl. 424-436.000.
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Fazzolari, Luciano; Giattini, Frank P.; Scoca, Anthony L.; and Zavacki, Eugene C., 4,954,996, Cl. 367-13.000.
Scott, Graham W.; Gough, Paul; Hendy, Brian N.; and Cinderey, Michael B., to Imperial Chemical Industries PLC. Gas separation. 4,954,143, Cl. 55-16.000.
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Scott, Keith W.; and Willoughby, Bryan G., to Rapra Technology Limited. Temperature activated catalysts for liquid polymer cures. 4,954,472, Cl. 502-152.000.
Scott, Michael J., to Aliflex New Zealand Limited. Ear tag for animals. 4,953,313, Cl. 40-301.000.
Scott Tech International, Inc.: *See*—
Bromley, Scott, 4,954,023, Cl. 408-1.00R.
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Seebode, Albert: *See*—
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Segaram, Para, to Sundstrand Corporation. Auto tracking notch filter using switched capacitors to measure harmonic distortion and noise contained in a signal source. 4,954,785, Cl. 328-167.000.
Segoshi, Kazuo; Okuda, Toshiyuki; Okamura, Kenji; and Yoshida, Mizuo, to Sigma Co., Ltd. Spectacle frame. 4,953,966, Cl. 351-41.000.
Seguchi, Tadao: *See*—
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Seiko Epson Corporation: *See*—
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Seiko Instruments Inc.: *See*—
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Nagaoka, Shinji; Kawai, Michio; and Sato, Koji, 4,954,861, Cl. 354-403.000.
Nakagawa, Tadashi; Otora, Takahito; and Nemoto, Ichiro, 4,954,860, Cl. 354-246.000.
Sekiguchi, Shigemi, to Hoaiden Electronics Co. Ltd. Connector plug with locking mechanism. 4,954,097, Cl. 439-352.000.
Sekine, Makoto: *See*—
Endo, Keiichi; Shinbo, Yasushi; Kageyama, Akira; Katsuya, Yasuo; Kato, Chihiro; Fukasawa, Masato; and Sekine, Makoto, 4,954,406, Cl. 430-60.000.
Sekiya, Harukazu: *See*—
Azeta, Takahiro; Kameyama, Toru; Sekiya, Harukazu; Moritani, Toshifumi; Higeta, Akira; Baba, Kenji; Matoba, Takeshi; Goto, Shinji; and Kubota, Kazuyuki, 4,953,846, Cl. 271-251.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei; Mase, Akira; and Sakayori, Hiroyuki, 4,954,217, Cl. 156-643.000.
Yamazaki, Shunpei, 4,954,856, Cl. 357-30.000.
Yamazaki, Shunpei, 4,954,985, Cl. 365-108.000.
Semin, Konstantin V.: *See*—
Spirin, Jury L.; Korbashov, Jury M.; Semin, Konstantin V.; and Sigov, Alexandr S., 4,954,771, Cl. 324-158.00R.
Senerchia, David C.: *See*—
Natusch, Paul J.; Yu, Eugene L.; Senerchia, David C.; and Henry, John F., Jr., deceased, 4,954,946, Cl. 364-200.000.
Sengoku, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Record medium control apparatus. 4,954,908, Cl. 360-78.040.

Sengoku, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Data memorizing device which determines the movement of the recording head. 4,954,909, Cl. 360-78.040.
Senoo, Seiji: *See*—
Tanabe, Toshiyuki; and Senoo, Seiji, 4,954,899, Cl. 358-191.100.
Senoo, Yoshio: *See*—
Komori, Teruyuki; Miyake, Shingo; and Senoo, Yoshio, 4,954,536, Cl. 523-149.000.
Sepulveda, Ralph R.; and Lynn, Jesse L., Jr., to Lever Brothers Company. Fabric pretreatment cleaning compositions. 4,954,286, Cl. 252-174.220.
Seroo, Jan M.; Cuypers, Martinus H.; and Oude Maatman, Anthonius J. H. M., to Hankamp B.V. Process for making, finishing crown wheels. 4,954,028, Cl. 409-26.000.
Servos, Michael: *See*—
Broszat, Lothar; Servos, Michael; and Schnitzler, Dieter, 4,953,894, Cl. 280-846.000.
Seto, Kunio: *See*—
Shirasaka, Akifumi; Seto, Kunio; Hamada, Masaki; and Shibuya, Yukari, 4,955,064, Cl. 382-22.000.
Severinsson, Lars M., to SAB Nordic AB. Actuator. 4,953,668, Cl. 188-158.000.
Severinsson, Lars M., to SAB Nife AB. Electro-mechanical brake unit, preferably for a rail vehicle. 4,953,669, Cl. 188-171.000.
Sewell Plastics, Inc.: *See*—
Austin, George H., 4,954,071, Cl. 425-531.000.
Sewell, Scott R.; and Fleming, Diane. Air conditioning compressor sectionalized cover. 4,953,328, Cl. 52-79.100.
Seynhaeve: Andre G., to Delsey S.A. Caster wheel. 4,953,257, Cl. 16-45.000.
Sezaki, Masaji: *See*—
Sato, Yoshikazu; Watabe, Hiroomi; Ishii, Shigetaka; Nakazawa, Tadashi; Shomura, Takashi; Sezaki, Masaji; and Kondo, Shinichi, 4,954,641, Cl. 549-384.000.
SGS-Thomson Microelectronics S.A.: *See*—
Pavlin, Antoine, 4,954,728, Cl. 307-296.800.
Shankland, Ian R.: *See*—
Batt, James A.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., 4,954,284, Cl. 252-170.000.
Shannon, Joseph W., to ABC/Sebrn TechCorp. Overflow prevention for soft drink dispensers. 4,953,751, Cl. 222-14.000.
Shapiro, Eugene: *See*—
Ashok, Sankaranarayanan; Cheskis, Harvey P.; and Shapiro, Eugene, 4,953,382, Cl. 72-262.000.
Sharber, Jerry; and Kilby, Frank, to Eldon Industries, Inc. Adjustable arm structures. 4,953,822, Cl. 248-281.100.
Sharp Kabushiki Kaisha: *See*—
Fuji, Hiroshi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; Terashima, Shigeo; and Fujiwara, Tsuneo, 4,954,903, Cl. 360-46.000.
Iwamura, Soichi; Murakami, Satoshi; and Itsumi, Tadashi, 4,955,048, Cl. 379-53.000.
Karita, Toshiaki; and Watanabe, Takashi, 4,954,914, Cl. 358-475.000.
Matsuo, Toshihisa; and Yamagishi, Toshio, 4,954,846, Cl. 355-311.000.
Noboru, Mitsuhiro, 4,955,076, Cl. 455-188.000.
Taniguchi, Kouji; Ogura, Takashi; and Tanaka, Koicji, 4,954,746, Cl. 313-506.000.
Shaw, Robert W.: *See*—
Gilkerson, Terence; and Shaw, Robert W., 4,954,160, Cl. 71-88.000.
Shea, Patrick A. Coupon organizer. 4,954,003, Cl. 402-079.000.
Sheaffer, Robin L.: *See*—
Sheaffer, William G.; and Sheaffer, Robin L., 4,953,823, Cl. 248-346.100.
Sheaffer, William G.; and Sheaffer, Robin L. Coaster and wipe. 4,953,823, Cl. 248-346.100.
Sheahan, Michael H.: *See*—
Brackmann, Warren A.; Snaidr, Stanislav M.; Nehyo, Takeshi; and Sheahan, Michael H., 4,953,570, Cl. 131-109.100.
Sheahan, Thomas H. Two-tier storage rack for vehicles. 4,954,038, Cl. 414-482.000.
Sheahen, Dana M.: *See*—
Hira, Gerald M.; Sheahen, Dana M.; Wilson, Pamela L.; and Nolan, Michael P., 4,954,948, Cl. 364-200.000.
Shelby Paper Box Company, The: *See*—
DeDino, Jeffery L., 4,953,700, Cl. 206-333.000.
Shell Internationale Research Maatschappij, B.V.: *See*—
Gilkerson, Terence; and Shaw, Robert W., 4,954,160, Cl. 71-88.000.
Shell Oil Company: *See*—
Bannon, Robert P., 4,954,294, Cl. 261-114.100.
Gelles, Richard; Willis, Carl L.; Lutz, Robert G.; and Gergen, William P., 4,954,568, Cl. 525-92.000.
Klingensmith, George B., 4,954,548, Cl. 524-258.000.
Potter, Michael W., 4,954,137, Cl. 48-210.000.
Smutny, Edgar J., 4,954,552, Cl. 524-356.000.
Smutny, Edgar J.; and Lutz, Robert G., 4,954,555, Cl. 524-399.000.
Smutny, Edgar J., 4,954,570, Cl. 525-185.000.
Wang, Pen-Chung, 4,954,583, Cl. 525-507.000.
Wang, Pen-Chung, 4,954,584, Cl. 525-507.000.
Shepherd Patents S.A.: *See*—
Wallsten, Hans I., 4,954,126, Cl. 600-36.000.
Shepler, Peter R.; Gammon, Nathan A.; Hopkins, William M.; Koerner, James E.; and Schmalix, Charles K., to Goodyear Tire & Rubber Company, The. Tread for a unidirectional pneumatic tire. 4,953,604, Cl. 152-209.00A.
Sherlock, Lila A.; and Finn, Maryann P. Safety mobilizer walker. 4,953,851, Cl. 272-70.300.
Sherwin, Gary W.; Hanes, Lewis F.; and Schmidt, Albert L., to Westinghouse Electric Corp. Automated visual assessment system with steady visual evoked potential stimulator and product detector. 4,953,968, Cl. 351-211.000.
Sheth, Pravin B.; and Dechow, Frederick J., to Ciba-Geigy Corporation. Oral magnesium and potassium compositions and use. 4,954,349, Cl. 424-461.000.
Shevkunov, Vsevolod V.: *See*—
Alexandrov, Maxim L.; Shevkunov, Vsevolod V.; and Pavlov, Alexandr J., 4,954,253, Cl. 210-198.200.
Shibano, Yoshizo: *See*—
Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, 4,955,082, Cl. 455-33.000.
Shibata, Minoru: *See*—
Fujizaki, Tsutomu; and Shibata, Minoru, 4,954,088, Cl. 439-73.000.
Shibata, Takanori: *See*—
Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, 4,954,586, Cl. 526-245.000.
Shibata, Tatsumi: *See*—
Ozaki, Keiichi; Manabe, Naoki; Shibata, Tatsumi; Hayashi, Hideharu; Muramatsu, Yukio; and Yamamoto, Masaki, 4,954,102, Cl. 439-535.000.
Shibata, Uichi: *See*—
Tachibana, Shunro; and Shibata, Uichi, 4,953,565, Cl. 128-798.000.
Shibukawa, Takeo, to Yamaha Corporation. Automatic performance apparatus storing and editing performance information. 4,953,438, Cl. 84-609.000.
Shibuya, Yukari: *See*—
Shirasaka, Akifumi; Seto, Kunio; Hamada, Masaki; and Shibuya, Yukari, 4,955,064, Cl. 382-22.000.
Shida, Masami: *See*—
Manaka, Toshio; and Shida, Masami, 4,953,530, Cl. 123-399.000.
Shields, William D. Method and apparatus for variable proportional weight lifting exercises. 4,953,855, Cl. 272-118.000.
Shifferly, John P. Sanitizing spray seat for toilet. 4,953,238, Cl. 4-420.200.
Shigeta, Junji: *See*—
Tanaka, Hirotoshi; Yamashita, Hiroki; Masuda, Noboru; Shigeta, Junji; Umemoto, Yasunari; and Kagaya, Osamu, 4,954,866, Cl. 357-45.000.
Shikama, Takashi; Wakabayashi, Asami; and Torii, Kiyofumi, to Murata Manufacturing Co., Ltd. Positive temperature coefficient thermistor device for a heating apparatus. 4,954,692, Cl. 219-365.000.
Shikano, Hiroshi: *See*—
Harada, Tsutomu; and Shikano, Hiroshi, 4,954,535, Cl. 523-139.000.
Shim-A-Line, Inc.: *See*—
Specktor, Gerald A.; and Specktor, John, 4,953,278, Cl. 29-402.060.
Shimada, Hiroyuki: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, 4,953,677, Cl. 192-3.300.
Shimada, Keiko: *See*—
Fujisaki, Hisashi; and Shimada, Keiko, 4,955,055, Cl. 379-390.000.
Shimada, Yuji: *See*—
Fukuda, Norisuke; and Shimada, Yuji, 4,953,253, Cl. 15-319.000.
Shimazaki, Toru, to Yokogawa Medical Systems, Limited. Scan controller for NMR imaging device. 4,954,780, Cl. 324-318.000.
Shimizu Construction Co., Ltd.: *See*—
Okano, Tadashi; and Honda, Tadayoshi, 4,953,720, Cl. 212-176.000.
Shimizu, Kazuyuki: *See*—
Tateishi, Terutaka; Koshino, Minoru; and Shimizu, Kazuyuki, 4,954,982, Cl. 364-900.000.
Shimochi, Eiji, to Yazaki Corporation. Electric connection box. 4,954,090, Cl. 439-76.000.
Shimotori, Tomoya: *See*—
Takano, Shusntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, 4,954,518, Cl. 514-456.000.
Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,955,067, Cl. 382-62.000.
Shin-Ei Kiko Co., Ltd.: *See*—
Chizaki, Isao, 4,954,044, Cl. 414-754.000.
Shin-Etsu Chemical Col, Ltd.: *See*—
Takeda, Yoshifumi; Takamizawa, Minoru; and Takeno, Tsutomu, 4,954,596, Cl. 528-14.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Amano, Tadashi; and Hoshida, Shigehiro, 4,954,595, Cl. 526-344.200.
Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, 4,954,586, Cl. 526-245.000.
Shin Nisso Kako Co., Ltd.: *See*—
Obitsu, Takeo; Ohnishi, Yutaka; Yoshinaka, Shinji; Koguchi, Minoru; Yanagita, Mitsuhiro; and Hirai, Nobuyuki, 4,954,631, Cl. 546-15.000.
Shinagawa, Yukio; Oikawa, Toru; Yamanouchi, Junichi; and Shiratsuchi, Kentaro, to Fuji Photo Film Co., Ltd. Diffusion transfer photographic film unit. 4,954,419, Cl. 430-215.000.
Shinbo, Yasushi: *See*—
Endo, Keiichi; Shinbo, Yasushi; Kageyama, Akira; Katsuya, Yasuo; Kato, Chihiro; Fukasawa, Masato; and Sekine, Makoto, 4,954,406, Cl. 430-60.000.

Shindo, Koji; and Tsuchihashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Master disk. 4,954,065, Cl. 425-175.000.
Shinnai, Masao; Nishikawa, Kazuya; Tsukada, Tokio; and Hirotsu, Tohru, to Central Glass Company, Limited. Vehicle window glass antenna coupled with defogging heater. 4,954,797, Cl. 343-704.000.
Shinnar, Reuel: *See*—
Ludmer, Zvi; Shinnar, Reuel; and Yakhot, Victor, 4,954,260, Cl. 210-634.000.
Shinohara, Hirofumi: *See*—
Kumanoya, Masaki; Shinohara, Hirofumi; Dosaka, Katsumi; Konishi, Yasuhiro; Komatsu, Takahiro; and Yamasaki, Hiroyuki, 4,954,992, Cl. 365-207.000.
Shinohara, Hiroichi: *See*—
Nakanishi, Keiichirou; Yamada, Minoru; Yamamoto, Masakazu; Ogihara, Satoru; Shinohara, Hiroichi; and Suzuki, Hideo, 4,954,877, Cl. 357-80.000.
Shionogi & Co, Ltd: *See*—
Kita, Toru; Narumiya, Shuh; Narisada, Masayuki; Watanabe, Fumrhio; Doteuchi, Masami; and Mizui, Takuji, 4,954,514, Cl. 514-381.000.
Shiosaki, Masao, to Kabushiki Kaisha Toshiba. Cassette transfer apparatus. 4,954,918, Cl. 360-98.060.
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, to Tokyo Electric Co., Ltd. Thermal printer with reciprocal paper feed control. 4,953,994, Cl. 400-120.000.
Shiozawa, Akira: *See*—
Tatee, Tochiro; Takahira, Takashi; Yamashita, Kouwa; Sakurai, Masao; Shiozawa, Akira; and Narita, Kazuhisa, 4,954,642, Cl. 549-389.000.
Shiozawa, Kenichiro: *See*—
Takiyama, Masahiro; Miyazaki, Kunihiro; and Shiozawa, Kenichiro, 4,954,141, Cl. 51-296.000.
Shirasaka, Akifumi; Seto, Kunio; Hamada, Masaki; and Shibuya, Yukari, to Canon Kabushiki Kaisha. Graphic edge extracting apparatus. 4,955,064, Cl. 382-22.000.
Shiratsuchi, Kentaro: *See*—
Shinagawa, Yukio; Oikawa, Toru; Yamanouchi, Junichi; and Shiratsuchi, Kentaro, 4,954,419, Cl. 430-215.000.
Shirley, Everett E.: *See*—
Bush, Arden W.; and Shirley, Everett E., 4,954,687, Cl. 219-119.000.
Shitaya, Takao: *See*—
Nagai, Takeshi; Fukuda, Hiroshi; Itoh, Masahiko; and Shitaya, Takao, 4,954,694, Cl. 219-413.000.
Shoji, Takeuchi; Katsuyoshi, Iino; and Ryoichi, Takahashi, to Sanden Corporation. Refrigerator-freezer unit. 4,953,362, Cl. 62-246.000.
Shomura, Takashi: *See*—
Sato, Yoshikazu; Watabe, Hiroomi; Ishii, Shigetaka; Nakazawa, Tadashi; Shomura, Takashi; Sezaki, Masaji; and Kondo, Shinichi, 4,954,641, Cl. 549-384.000.
Showa Denko Kabushiki Kaisha: *See*—
Kotani, Terumitsu; Taka, Toshio; and Saito, Yoshimasa, 4,954,391, Cl. 428-220.000.
Ogaro, Katsunori; Nojima, Hiroshi; Hashizume, Nobuyuki; Ohno, Norio; and Naito, Taketoshi, 4,954,512, Cl. 514-352.000.
Takiyama, Masahiro; Miyazaki, Kunihiro; and Shiozawa, Kenichiro, 4,954,141, Cl. 51-296.000.
Yoshida, Haruo; Uotani, Nobuo; and Saida, Yoshihiro, 4,954,590, Cl. 526-259.000.
Shu, Dong B.: *See*—
Kim, Jong S.; Lee, Ki T.; and Shu, Dong B., 4,954,615, Cl. 528-501.000.
Shuh-Chin, Lin. Aquatic sports device. 4,954,106, Cl. 440-21.000.
Shuku, Shigekazu; Mukoyoshi, Shunichiro; Yuasa, Eiji; and Yamori, Tsunefumi, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording materials. 4,954,477, Cl. 503-226.000.
Shultz, David B.: *See*—
Tonn, Howard E.; Davidson, Robert; Shultz, David B.; and Miller, Keith R., 4,953,727, Cl. 213-8.000.
Shum, Victor K.: *See*—
Miller, Jeffrey T.; and Shum, Victor K., 4,954,245, Cl. 208-138.000.
Sibley, Howard W.: *See*—
Boah, John K.; Cooney, Charles T., Jr.; Schoch, Stephen A.; and Sibley, Howard W., 4,953,511, Cl. 122-18.000.
Siczek, Aldona A.; and Siczek, Bernard W. C-arm for X-ray diagnostic examination. 4,955,046, Cl. 378-197.000.
Siczek, Bernard W.: *See*—
Siczek, Aldona A.; and Siczek, Bernard W., 4,955,046, Cl. 378-197.000.
Siegenthaler, Peter, to Seewer AG. Apparatus for winding sheets of dough on a dough reel and dough sheeter equipped with a dough sheeter winder. 4,954,064, Cl. 425-162.000.
Siegfried, Todd R. Gardening tool. 4,953,347, Cl. 56-400.120.
Siegmund, Gary G., to Reliance Comm/Tec Corporation. Solid state ringing switch. 4,955,053, Cl. 379-253.000.
Siemens Aktiengesellschaft: *See*—
Bergmann, Rainer; and Gantioler, Josef-Matthias, 4,954,868, Cl. 357-53.000.
Brunner, Matthias; and Lischke, Burkhard, 4,954,705, Cl. 250-310.000.
Brust, Hans D., 4,954,773, Cl. 324-158.00R.
Friede, Dirk; Cirkel, Hans-Juergen; Baumgartl, Rudolf; and Schmutzler, Matthias, 4,955,045, Cl. 378-122.000.
Hoelzle, Josef, 4,955,041, Cl. 377-54.000.
Hums, Erich, 4,954,476, Cl. 502-350.000.
Kindt, Stefan, 4,955,086, Cl. 455-605.000.
Liebich, Ernst; and Longueville, Jacques, 4,954,103, Cl. 439-751.000.
Lobjinski, Manfred; Horn, Michael; and Reppekus, Andreas, 4,955,015, Cl. 370-56.000.
Nekovar, Anton, 4,955,043, Cl. 378-108.000.
Sarkoezi, Imre, 4,955,040, Cl. 375-119.000.
Schabert, Hans-Peter; Strickroth, Erich; and Laurer, Erwin, 4,953,580, Cl. 285-23.000.
Schmidt, Hans, 4,954,671, Cl. 200-50.00C.
Sieradzki, Raymond: *See*—
Bull, Larry J.; Sieradzki, Raymond; and Olson, Kurt G., 4,954,556, Cl. 524-378.000.
Sigma Co., Ltd.: *See*—
Segoshi, Kazuo; Okuda, Toshiyuki; Okamura, Kenji; and Yoshida, Mizuo, 4,953,966, Cl. 351-41.000.
Signode Corporation: *See*—
Kato, Kanami, 4,953,599, Cl. 140-93.400.
Sigov, Alexandr S.: *See*—
Spirin, Jury L.; Korbashov, Jury M.; Semin, Konstantin V.; and Sigov, Alexandr S., 4,954,771, Cl. 324-158.00R.
Sikora, Scott T., to Tomar Electronics, Inc. Strobe flash lamp power supply with input voltage feedthrough afterflow prevention circuit. 4,954,753, Cl. 315-219.000.
Sikorski, Seigfried, to MTU Motoren-und Turbinen-Union Munchen GmbH. Composite material of metal and plastic. 4,954,387, Cl. 428-138.000.
Simandi, Laszlo : *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.
Simmat, Dieter: *See*—
Korber, Hans W.; Koster, Reinhard; Linse, Ewald; and Simmat, Dieter, 4,953,645, Cl. 180-6.500.
Simmons, Walter J., to Du Pont de Nemours, E. I., and Company. Wave powered pump. 4,954,052, Cl. 417-331.000.
Simon, Ernst-Ulrich: *See*—
Fleischer, Helmut; Simon, Ernst-Ulrich; and Schmitt, Gunter, 4,954,807, Cl. 340-459.000.
Simplex, S.A.: *See*—
Juy, Henri, 4,954,121, Cl. 474-82.000.
Sims, Louis; LeFriec, Fred; Dubner, Joseph; and Peavey, Brian, to Output Technology Corporation. Dot matrix printer and method for printing multiple lines at different line spacings. 4,953,995, Cl. 400-121.000.
Singh, Gurvinder P. Apparatus and method for expert analysis of metal failure with automated visual aide. 4,954,964, Cl. 364-513.000.
Singleton, Guy E.: *See*—
Dixon, Robert C.; Deaver, Gerald A.; Punches, James R.; Singleton, Guy E.; Erbes, John G.; and Offer, Henry P., 4,954,311, Cl. 376-258.000.
Sinha, Ashok K.: *See*—
Fertl, Walter H.; and Sinha, Ashok K., 4,953,399, Cl. 73-152.000.
Sisco, Rosemary M.: *See*—
Elliott, David L.; Christiano, Steven P.; Lang, David J.; and Sisco, Rosemary M., 4,954,280, Cl. 252-90.000.
Skaggs, Roger D. Rock drill bit. 4,953,642, Cl. 175-393.000.
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Mannesmann, Gerda; Schillinger, Ekkehard; and Town, Michael H., to Schering Aktiengesellschaft. Novel carbacylcins, their preparation and use as medicinal agents. 4,954,524, Cl. 514-530.000.
Slachta, Gene; and Stemler, Kim F. Fluid actuated chuck. 4,953,877, Cl. 279-2.00A.
Slaymaker, Philip A.: *See*—
Anafi, David; and Slaymaker, Philip A., 4,953,964, Cl. 350-557.000.
Slick Ice Limited: *See*—
Rzechula, Michael J., 4,953,360, Cl. 62-66.000.
Slowski, Darrel: *See*—
Slowski, Wasyl; Slowski, Darrel; and Slowski, David, 4,954,099, Cl. 439-244.000.
Slowski, David: *See*—
Slowski, Wasyl; Slowski, Darrel; and Slowski, David, 4,954,099, Cl. 439-244.000.
Slowski, Wasyl; Slowski, Darrel; and Slowski, David, to Williams Sign Supplies Ltd. Electrode receptacle. 4,954,099, Cl. 439-244.000.
Smallheer, Joanne: *See*—
Gleason, John G.; Hall, Ralph F.; and Smallheer, Joanne, 4,954,513, Cl. 514-381.000.
Smeltz, Kenneth C.: *See*—
Putzig, Donald E.; and Smeltz, Kenneth C., 4,953,621, Cl. 166-308.000.
Smerecky, Jerry R.: *See*—
Sattinger, Stanley S.; Lu, Leo K. H.; and Smerecky, Jerry R., 4,954,375, Cl. 428-34.100.
Smith, Bert J., to United States of America, Army. Self-driving helicopter tail rotor. 4,953,811, Cl. 244-17.190.
Smith, Chalmers O. Welding unit. 4,954,689, Cl. 219-125.100.
Smith, David W.; Yocca, Frank D.; Yevich, Joseph P.; and Mattson, Ronald J., to Bristol-Myers Squibb Company. 1-indolyalkyl-4-(substituted-pyridinyl)piperazines. 4,954,502, Cl. 514-253.000.
Smith, David W.: *See*—
Hill, Godfrey R.; Smith, David W.; and Hunkin, David J., 4,955,026, Cl. 372-18.000.
Smith, Fred P.: *See*—
Smith, Fred T.; and Smith, Fred P., 4,954,020, Cl. 406-38.000.

Smith, Fred T.; and Smith, Fred P., 4,954,040, Cl. 414-513.000.
Smith, Fred T.; and Smith, Fred P., to Heil Co., The. Apparatus for loading materials into a storage compartment. 4,954,020, Cl. 406-38.000.
Smith, Fred T.; and Smith, Fred P., to Heil Co., The. Refuse truck body having load carrying ejector assembly. 4,954,040, Cl. 414-513.000.
Smith-Johannsen, Robert; and Walker, Jack M., to Raychem Corporation. Self-limiting conductive extrudates and methods therefor. 4,954,695, Cl. 219-548.000.
Smith, Leslie, Jr.: *See*—
Johnston, William T.; Smith, Leslie, Jr.; and Barker, David K., 4,954,039, Cl. 414-500.000.
Smith, Lynn H. Apparatus and associated methods for forming curved wooden hand rails for spiral staircases and the like. 4,953,602, Cl. 144-349.000.
Smith, Michael B.: *See*—
Savage-Rumbaugh, E. Sue; Rumbaugh, Duane M.; Smith, Samuel O.; and Smith, Michael B., 4,953,500, Cl. 119-17.000.
Smith, Peter R.: *See*—
Chatigny, Joseph V.; and Smith, Peter R., 4,954,811, Cl. 340-550.000.
Smith, Rod; Oliphant, Timothy L.; and Stephens, Charles E., to National Seating Company. Air spring seat and air pump. 4,954,051, Cl. 417-305.000.
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Smith, Ward C., to Becton-Dickinson and Company. Apparatus for separating mononuclear cells from blood and method of manufacturing and using the same. 4,954,264, Cl. 210-782.000.
Smith, Winston J., to Smith, Winston J. Wave operated boat pump. 4,953,490, Cl. 114-183.00A.
SmithKline Beecham Corporation: *See*—
Dagger, Raymond E.; and Motyka, Linda A., 4,954,632, Cl. 546-194.000.
Gleason, John G.; Hall, Ralph F.; and Smallheer, Joanne, 4,954,513, Cl. 514-381.000.
Holt, Dennis A.; Levy, Mark A.; and Metcalf, Brian W., 4,954,446, Cl. 435-184.000.
SmithKline & French Laboratories Limited: *See*—
Jaxa-Chamiec, Albert A.; and Hickey, Deirdre M. B., 4,954,339, Cl. 424-78.000.
Smolders, Jo: *See*—
Ubanski, Patrick; and Smolders, Jo, 4,954,801, Cl. 336-90.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Rothenpieler, Manfred; and Moos, Wolfgang, 4,953,806, Cl. 242-72.100.
Svagr, Alexander, 4,953,380, Cl. 72-250.000.
Smutny, Edgar J., to Shell Oil Company. Stabilized carbon monoxide-olefin copolymer compositions. 4,954,552, Cl. 524-356.000.
Smutny, Edgar J.; and Lutz, Robert G., to Shell Oil Company. Stabilized carbon monoxide-olefin copolymer compositions. 4,954,555, Cl. 524-399.000.
Smutny, Edgar J., to Shell Oil Company. Polyketone polymer blend. 4,954,570, Cl. 525-185.000.
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Brackmann, Warren A.; Snaidr, Stanislav M.; Nehyo, Takeshi; and Sheahan, Michael H., 4,953,570, Cl. 131-109.100.
Societe Anonyme, Bioetica: *See*—
Gimeno, Rene ; Huc, Alain; and DeVictor, Pierre, 4,953,299, Cl. 34-92.000.
Societe Anonyme dite:Alsthom: *See*—
Dubots, Patrick; and Legat, Denis, 4,954,479, Cl. 505-1.000.
Societe Atochem: *See*—
Correia, Yves; Drivon, Gilles; and Lesparre, Jean, 4,954,231, Cl. 204-157.600.
Societe Chimique des Charbonnages S.A.: *See*—
Sorg, Kurt, 4,954,550, Cl. 524-271.000.
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Comparat, Vincent; Ballon, Jean; Carrechio, Pierre; and Pelissier, Alain, 4,954,710, Cl. 250-385.100.
Sockell, Edward J., to Standard Oil Company, The. AOG incinerator NO_x emission control via NH_3 injection. 4,954,323, Cl. 423-235.000.
Soda, Yasunari: *See*—
Mochiji, Kozo; Oizumi, Hiroaki; Soda, Yasunari; Ogawa, Taro; and Kimura, Takeshi, 4,954,424, Cl. 430-323.000.
Sokola, Raymond L.: *See*—
Green, Steven R.; De Muro, David M.; Moutrie, Michael F.; Sokola, Raymond L.; and Gordon, Phillip J., 4,954,796, Cl. 333-206.000.
Solarex Corporation: *See*—
Marshall, Jack, 4,953,577, Cl. 136-251.000.
Solie, Darryl W.: *See*—
Freeman, William A.; Pogorzelski, James S.; Solie, Darryl W.; and Wilson, Jacqueline H., 4,954,950, Cl. 364-200.000.
Solis S.r.l.: *See*—
Gazzarrini, Vinicio, 4,953,687, Cl. 198-347.100.
Gazzarrini, Vinicio, 4,954,045, Cl. 414-792.700.
Solvay & Cie (Societe Anonyme): *See*—
Callens, Roland; and Collin, Andre, 4,954,616, Cl. 530-333.000.
Somar Corporation: *See*—
Akutagawa, Ichiro; Yamaguchi, Tsutomu; Hanamori, Toshihiro; Matsuzaki, Kunimitsu; and Okamura, Shinobu, 4,954,602, Cl. 528-93.000.
Somerville, Walter D. Nasion-secured sport glasses. 4,953,967, Cl. 351-136.000.
Sonoco Products Company: *See*—
Vrooman, Carll D.; and Taylor, Dennis R., 4,953,664, Cl. 186-59.000.
Sony Corporation: *See*—
Aratani, Katsuhisa; and Tanaka, Tomiji, 4,955,007, Cl. 369-13.000.
Doi, Tetsuo; and Funabashi, Takeshi, 4,955,061, Cl. 382-56.000.
Isozaki, Masaaki; and Takano, Kazuhiro, 4,954,826, Cl. 341-100.000.
Koda, Atsushi; Okuda, Shinji; and Nonaka, Wataru, 4,954,915, Cl. 360-92.000.
Nakata, Tetsuro, 4,954,898, Cl. 358-183.000.
Odaka, Kentaro, 4,955,022, Cl. 371-37.400.
Okada, Takashi; and Matsuzaki, Atsushi, 4,954,901, Cl. 358-242.000.
Tobimatsu, Noriaki, 4,954,916, Cl. 360-96.500.
Soo-Hoo, Randall; and Benz, August D., to Bechtel Group, Inc. Geothermal reboiler apparatus and method. 4,953,356, Cl. 60-641.500.
Sophis Systems N.V.: *See*—
Noonan, Kevin K., 4,954,976, Cl. 364-578.000.
Soptei, Csaba: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.
Sorg, Kurt, to Societe Chimique des Charbonnages S.A. System for thermoplastic cross-linking adhesives, their preparation and a corresponding method of gluing. 4,954,550, Cl. 524-271.000.
Soubrier, Jean-Marie: *See*—
Buisson, Jean-Michel; and Soubrier, Jean-Marie, 4,954,767, Cl. 323-283.000.
Sourdillon-Airindex: *See*—
De Gouville, Jean-Bernard L.; and Dane, Bernard, 4,953,534, Cl. 126-39.00H.
Southwall Technologies, Inc.: *See*—
King, Robert N.; and Behling, Gerald R., 4,954,383, Cl. 428-131.000.
Sovak, Milos; and Ranganathan, Ramachandran, to Cook Imaging Corporation. Non-ionic polyol contrast media from ionic contrast media. 4,954,348, Cl. 424-5.000.
Spainhour, Phillip A., to Hennessy, J. P. Method and apparatus for providing runout compensation. 4,953,296, Cl. 33-203.180.
Spamer, William S., to Mead Corporation, The. Article organizer display unit. 4,953,719, Cl. 211-188.000.
Span Tech Corporation: *See*—
Draebel, Jorgen, 4,953,693, Cl. 198-853.000.
Sparta, Gregory, to Ciba-Geigy Corporation. Orally administrable nifedipine solution in a solid light resistant dosage form. 4,954,346, Cl. 424-456.000.
Specktor, Gerald A.; and Specktor, John, to Shim-A-Line, Inc. Method for adjusting alignment of a wheel. 4,953,278, Cl. 29-402.060.
Specktor, John: *See*—
Specktor, Gerald A.; and Specktor, John, 4,953,278, Cl. 29-402.060.
Spector, George: *See*—
Gaines, Lee R.; and Spector, George, 4,953,232, Cl. 2-60.000.
Kidder, Stephen E.; and Spector, George, 4,954,934, Cl. 362-156.000.
Spectral Sciences, Inc.: *See*—
Adler-Golden, Steven; Goldstein, Neil; and Bien, Fritz, 4,953,976, Cl. 356-301.000.
Spectrum Control, Inc.: *See*—
Yializis, Angelo, 4,954,371, Cl. 427-44.000.
Speisebecher, Joachim: *See*—
Wooge, Christian; and Speisebecher, Joachim, 4,953,739, Cl. 220-93.000.
Spencer, H. Kenneth: *See*—
Bagley, Jerome R.; and Spencer, H. Kenneth, 4,954,506, Cl. 514-272.000.
Spirex Corporation: *See*—
Colby, Paul N., 4,953,279, Cl. 29-402.060.
Spirin, Jury L.; Korbashov, Jury M.; Semin, Konstantin V.; and Sigov, Alexandr S. Stimulus generator. 4,954,771, Cl. 324-158.00R.
Sprague, Michael M.: *See*—
Carter, John L.; Sprague, Michael M.; Stone, Crosby; and Felsheim, James A., 4,953,298, Cl. 34-44.000.
Springer, Carl M., to Binks Manufacturing Company. Positive displacement flushable flow meter. 4,953,403, Cl. 73-198.000.
Spry, Robert H. Apparatus and method for testing moisture of ear corn. 4,954,783, Cl. 324-696.000.
Squires, John J.: *See*—
Basista, Joseph F.; Ma, Wai M.; and Squires, John J., 4,953,929, Cl. 350-96.200.
SSMC Inc.: *See*—
Davidson, Donald R.; Huang, Pao-Ter; and Rogers, H. David, 4,953,300, Cl. 38-36.000.
Stachulski, Andrew V.: *See*—
Ponsford, Roger J.; and Stachulski, Andrew V., 4,954,489, Cl. 514-195.000.
Stadig, Allen L. Holder and dispenser for a coiled article. 4,953,810, Cl. 242-129.000.
Staege, Manfred: *See*—
Rehage, Gerhard; Staege, Manfred; and Grunkemeier, Hans W., 4,953,274, Cl. 29-27.00C.
Staker, Doanld D.; and Kain, William S., to Henkel Corporation. Compositions and process for alfalfa drying. 4,954,363, Cl. 426-636.000.

Stakvat Pty. Ltd.: *See*—
Prime, Martlyn L.; Warren, Peter F.; Johnston, Geoffrey D.; and Babidge, John C., 4,953,730, Cl. 217-4.000.
Stammer, Charles H., to University of Georgia Research Foundation, Inc. 2,3-methanoproline. 4,954,158, Cl. 71-76.000.
Standard Elektrik Lorenz Aktiengesellschaft: *See*—
Regner, Rolf; and Scholz, Joachim, 4,953,936, Cl. 350-96.170.
Standard Oil Company, The: *See*—
Johal, Sarjit S.; and Cash, Howard A., 4,954,440, Cl. 435-101.000.
Sockell, Edward J., 4,954,323, Cl. 423-235.000.
Stander, Robert J.: *See*—
Frye, Dale J.; Lindberg, Kenneth M.; Kindig, Alan L.; Stander, Robert J.; Buonodono, Joseph B.; Gras, Jeffrey D.; and Orios, David A., 4,953,259, Cl. 16-225.000.
Stanley, Jack M. Self-retaining golf bag cover employing plain sleeve. 4,953,697, Cl. 206-315.400.
Stant Inc.: *See*—
Szlaga, Emil, 4,953,583, Cl. 137-118.000.
Stanton, Austin N.: *See*—
Keller, Leonard J.; and Stanton, Austin N., 4,953,479, Cl. 110-233.000.
Stanton, Susan A.: *See*—
Rains, Randall C.; Dormish, Jeffrey F.; Stanton, Susan A.; and Rieck, James N., 4,954,199, Cl. 156-331.700.
Starck, Mark. Work holder apparatus. 4,953,836, Cl. 269-17.000.
Starkey, David T., to Gulbransen Incorporated. Method and apparatus for digitally generating musical notes. 4,953,437, Cl. 84-603.000.
Starr, Robert C.; and Ingleton, Robert A., to University of Waterloo. Apparatus for recovering ground soil samples. 4,953,637, Cl. 175-20.000.
Stava, Elliott K.: *See*—
Parka, John M.; and Stava, Elliott K., 4,954,691, Cl. 219-137.0PS.
STC PLC: *See*—
Epworth, Richard E., 4,953,939, Cl. 350-96.190.
Rokos, George H. S., 4,954,865, Cl. 357-43.000.
Stebco Products Corporation: *See*—
Stein, Edward B., 4,953,888, Cl. 280-654.000.
Stechert, Roland: *See*—
Rauber, Gerhard; and Stechert, Roland, 4,954,505, Cl. 514-267.000.
Steele, John, to T K Valve Limited. Ball valves for pipelines. 4,953,587, Cl. 137-315.000.
Stehmeier, Dieter: *See*—
Knoche, Karl F.; Stehmeier, Dieter; and Grabenhenrich, Heinz-Bernd, 4,953,361, Cl. 62-79.000.
Stein, Edward B., to Stebco Products Corporation. Luggage cart. 4,953,888, Cl. 280-654.000.
Stein, Judith; Leonard, Tracey M.; and Desorcie, James L., to General Electric Company. Method for coating substrates with UV curable epoxysilicone compositions. 4,954,364, Cl. 427-54.100.
Stein, William L.: *See*—
Evans, Alan G.; and Stein, William L., 4,954,833, Cl. 342-357.000.
Stemler, Kim F.: *See*—
Slachta, Gene; and Stemler, Kim F., 4,953,877, Cl. 279-2.00A.
Stenson, Samuel H. Powered method and apparatus for lifting a boat. 4,954,011, Cl. 405-3.000.
Stentiford, Frederick W. M., to British Telecommunications public company limited. Pattern recognition system. 4,955,056, Cl. 381-43.000.
Stepanov, Jury I.: *See*—
Urvantsev, Anatoly I.; Elantsev, Jury S.; Komlev, Alexei M.; Kusembaev, Saliman K.; Stepanov, Jury I.; and Vasiliev, Viktor P., 4,954,248, Cl. 209-127.100.
Stephens, Charles E.: *See*—
Smith, Rod; Oliphant, Timothy L.; and Stephens, Charles E., 4,954,051, Cl. 417-305.000.
Sterlacci, Dennis J. Electrician's utility knife. 4,953,293, Cl. 30-124.000.
Stetson, Harold M.: *See*—
Peterson, Edwin H.; Stetson, Harold M.; and Swinderman, Robert T., 4,953,689, Cl. 198-497.000.
Stevens, James R.; and Stevens, Jodi. Front rack for a truck. 4,953,757, Cl. 224-310.000.
Stevens, Jodi: *See*—
Stevens, James R.; and Stevens, Jodi, 4,953,757, Cl. 224-310.000.
Stewart Warner Instrument Corporation: *See*—
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Stichting Instituut Voor Veeteeltkundig Onderzoek "Schoonoord": *See*—
Lambooy, Elbert, 4,953,263, Cl. 17-1.00E.
Stiefel, Edward L.: *See*—
Halbert, Thomas R.; Wei, Liwen; and Stiefel, Edward L., 4,954,645, Cl. 556-45.000.
Stirbis, James S. One piece can body with domed bottom. 4,953,738, Cl. 220-606.000.
Stiver, C. Edward; Teti, George J.; Pearson, Charles S.; and Brown, Kenneth R., to Dayco Products, Inc. Crimping device, adjusting ring therefor. 4,953,383, Cl. 72-402.000.
Stocker, Werner: *See*—
Fink, Hans-Werner; Morin, Roger; Schmid, Heinz; and Stocker, Werner, 4,954,711, Cl. 250-423.00R.
Stoddard, Philip V.; and Bell, Craig J., to Mallinckrodt, Inc. Laser resistant ventilating device with locking ferrule. 4,953,548, Cl. 128-207.140.
Stohr, Albert. Cabin-like cover especially for covering a machine. 4,953,734, Cl. 220-4.020.
Stone, Crosby: *See*—
Carter, John L.; Sprague, Michael M.; Stone, Crosby; and Felsheim, James A., 4,953,298, Cl. 34-44.000.
Stone, William H.; and Boyer, William E., to Infotron Systems Corporation. Bus architecture for digital communications. 4,955,020, Cl. 370-85.900.
Stoner, David T.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,955,024, Cl. 371-40.100.
Stoppani, Brian R.; and Cummings, Norman, to Gullick Dobson Limited. Drive frame for a scraper chain conveyor. 4,953,692, Cl. 198-834.000.
Storaasli, Allen G.: *See*—
Grant, Richard W.; and Storaasli, Allen G., 4,954,832, Cl. 342-352.000.
Storgard, Christer, to Oy Wiik & Hoglund AG. Sewer pipe relining method. 4,954,016, Cl. 405-184.000.
Stork Amsterdam B.V.: *See*—
Hermans, Willem F., 4,953,633, Cl. 165-109.100.
Stough, Donna M.: *See*—
Butcher, Kenneth R.; Doddato, Carmine M.; and Stough, Donna M., 4,954,138, Cl. 51-293.000.
Stowe, George R., III, to Chevron Research Company. Method for improving the steam splits in a multiple steam injection process. 4,953,635, Cl. 166-303.000.
Stoy, Vladimir: *See*—
Thakore, Yatin B.; and Stoy, Vladimir, 4,954,145, Cl. 55-16.000.
Strahan, Daryl J.: *See*—
Potzler, J. Edward; and Strahan, Daryl J., 4,955,032, Cl. 364-525.000.
Strato-Lift,Inc.: *See*—
Ridings, James, 4,953,666, Cl. 187-9.00R.
Strazzolini, Paolo: *See*—
Malabarba, Adriano; Strazzolini, Paolo; Trani, Aldo; Magni, Ambrogio; and Cavalleri, Bruno, 4,954,483, Cl. 514-9.000.
Strebel, Hannes. Vehicle park for parking vehicles below a water surface. 4,954,035, Cl. 414-228.000.
Strein, Klaus: *See*—
Mertens, Alfred; von der Saal, Wolfgang; Boehm, Erwin; and Strein, Klaus, 4,954,498, Cl. 514-254.000.
Strickroth, Erich: *See*—
Schabert, Hans-Peter; Strickroth, Erich; and Laurer, Erwin, 4,953,580, Cl. 285-23.000.
Striker, Richard A.: *See*—
Modic, Frank J.; and Striker, Richard A., 4,954,533, Cl. 521-82.000.
Strobl, Wolfgang; Peschka, Walter; and Schneider, Gottfried, to Bayerische Motoren Werke AG. Arrangement for the metered supply of a fuel, especially into the combustion space of an internal combustion engine. 4,953,789, Cl. 239-132.500.
Stroech, Klaus; Beilefeldt, Dietmar; Brandes, Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Azolymethyl-cyclopropyl carbinol derivatives. 4,954,162, Cl. 71-92.000.
Struik, Mattheus: *See*—
Wesdorp, Leendert H.; and Struik, Mattheus, 4,954,362, Cl. 426-602.000.
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zolifrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Fungicides and plant-growth controlling agents. 4,954,495, Cl. 514-231.200.
Strupczewski, Joseph T.; and Bordeau, Kenneth J., to Hoechst-Roussel Pharmaceuticals, Inc. 3-(1-substituted-4-piperazinyl)-1H-indazoles. 4,954,503, Cl. 514-254.000.
Studt, William L.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; Studt, William L.; and Faith, William C., 4,954,494, Cl. 514-210.000.
Su, Kai C.: *See*—
Hung, William M.; and Su, Kai C., 4,954,132, Cl. 8-507.000.
Suchoski, Paul G., Jr.; Findakly, Talal K.; and Leonberger, Frederick J., to United Technologies Corporation. Integrated optic star coupler. 4,953,935, Cl. 350-96.160.
Suda, Yasuo: *See*—
Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 4,954,701, Cl. 250-201.800.
Sudakoff, Carle H.; and Matthews, Billie D., to Tandem Mfg., Inc. Jogging stroller. 4,953,880, Cl. 280-47.380.
Sudit, Moises. Electrically shorting target. 4,953,875, Cl. 273-373.000.
Suenaga, Nobuyoshi: *See*—
Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.
Suga, Shigeru: *See*—
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Suga Test Instruments Co., Ltd.: *See*—
Mitsuhashi, Kenhachi; and Suga, Shigeru, 4,954,693, Cl. 219-400.000.
Sugata, Yoshinobu; Furusho, Noboru; and Tanaka, Tomomi, to Fuji Electric Co., Ltd. Photoconductor for electrophotography comprising squarylium containing generator layer and hydrazone containing transport layer. 4,954,405, Cl. 430-58.000.
Sugawara, Kiyomi; Tsutsumi, Kentaro; and Otani, Mikio, to Central Glass Company, Limited. Soluble and curable fluorine-containing copolymer suitable as paint vehicle. 4,954,589, Cl. 526-255.000.
Sugayama, Sakae, to Sanyo Electric Co., Ltd. Automatic search tuner. 4,955,073, Cl. 455-161.000.

Sagayama, Sakae, to Sanyo Electric Co., Ltd. Radio with broad band automatic gain control circuit. 4,955,077, Cl. 455-197.000.

Sagazaki: Kazuo: *See*—
Iwamoto, Mune; Ito, Norifumi; Sagazaki: Kazuo; Matsubara, Tetsuyuki; and Ando, Toshihiko, 4,954,571, Cl. 525-205.000.

Sagden, Kenneth B., to Sundstrand Corporation. Oil supply for integrated drive generator. 4,953,663, Cl. 184-6.120.

Sagihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, to Takeda Chemical Industries, Ltd. Piperidine derivatives, their production and use. 4,954,625, Cl. 540-500.000.

Sagimoto, Shigeru: *See*—
Mochida, Mitsuyoshi; Maekawa, Tokuo; Takei, Hisashi; Matsumoto, Yasuo; Ohmura, Hiroshi; Sugimoto, Shigeru; Ushiro, Seimei; Asano, Seiji; and Yoshida, Toshio, 4,954,857, Cl. 354-75.000.

Sagita, Tooru, to Nifco Inc. Molding for car windowpane. 4,953,907, Cl. 296-93.000.

Sagiura, Ikuzo: *See*—
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 4,953,994, Cl. 400-120.000.

Sagiura, Yoshio: *See*—
Yamakawa, Kiyoshi; Sugiura, Yoshio; and Tsuruki, Satoru, 4,954,956, Cl. 364-419.000.

Sallivan, Charles T., to Honeywell Inc. Color signature sensor. 4,954,972, Cl. 364-526.000.

Sellivan, Donald F., to M&T Chemicals Inc. Photoflashing a liquid polymer layer on a phototool surface exposed to air. 4,954,421, Cl. 430-271.000.

Sullivan, Patrick M.: *See*—
Flotow, Richard A.; and Sullivan, Patrick M., 4,953,680, Cl. 192-111.00B.

Sulner, Andrew: *See*—
Greenberg, Bernard; and Sulner, Andrew, 4,954,265, Cl. 210-710.000.

Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Tilt cylinder device. 4,954,107, Cl. 440-61.000.

Sumita, Masaki: *See*—
Miyake, Norihisa; Sumita, Masaki; and Sarugaku, Shinichi, 4,954,762, Cl. 318-568.190.

Sumitani, Koji: *See*—
Onodera, Tamio; Sakai, Tokuji; Yamasaki, Yasuo; and Sumitani, Koji, 4,954,326, Cl. 423-328.000.

Sumitomo Chemical Company, Ltd.: *See*—
Abe, Tadashi; Manabe, Mitsuyoshi; Deguchi, Koji; Uhara, Hiroyuki; and Aoki, Yukio, 4,954,650, Cl. 562-534.000.
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,954,626, Cl. 544-105.000.
Okumura, Takuzo; Okada, Toyokazu; Kikui, Hitoshi; and Nakata, Kazuo, 4,953,952, Cl. 350-337.000.
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,954,651, Cl. 562-856.000.

Sumitomo Electric Industries Ltd.: *See*—
Hashida, Koichi; and Kohno, Teruhisa, 4,953,918, Cl. 303-115.000.
Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, 4,955,082, Cl. 455-33.000.
Nishimura, Akira; and Nakasuji, Masaaki, 4,953,945, Cl. 350-96.230.
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Sumitomo Rubber Industries, Limited: *See*—
Barsos, Clifford W., 4,953,392, Cl. 73-146.000.
Kawamura, Kazuhiko; and Sato, Kazuo, 4,953,605, Cl. 152-541.000.

Sumiya, Koji: *See*—
Moroto, Shuzo; Kawai, Masao; Yokoyama, Shoji; Kobayashi, Koji; and Sumiya, Koji, 4,954,959, Cl. 364-449.000.

Sun-Tec Co., Ltd.: *See*—
Matsumoto, Mitsuo, 4,954,203, Cl. 156-361.000.

Sunds Defibrator Aktiebolag: *See*—
Reinhall, Rolf B.; Johansson, Johan G. I.; and Mokvist, Anders V., 4,954,221, Cl. 162-261.000.
Virving, Nils, 4,953,796, Cl. 241-298.000.

Sundstrand Corporation: *See*—
Aldrich, Allyn M., 4,953,675, Cl. 192-8.00R.
Crowe, Lawrence E.; and Sutrina, Thomas A., 4,954,876, Cl. 357-76.000.
Segaram, Para, 4,954,785, Cl. 328-167.000.
Sugden, Kenneth B., 4,953,663, Cl. 184-6.120.

Superior Electric Company, The: *See*—
Brigham, Robert N., 4,954,740, Cl. 310-185.000.

Sursuer, Michael; and Bittner, Helmut, to Messerschmitt-Bolkow Blohm GmbH. Adaptive nonlinear frequency domain filter with low phase loss. 4,954,732, Cl. 307-520.000.

Surgical Dynamics, Inc.: *See*—
Ray, Charles D.; and Dickhudt, Eugene A., 4,953,540, Cl. 128-20.000.

Susumi, Sadao: *See*—
Maeda, Haruhisa; Tsujikawa, Akira; and Susumi, Sadao, 4,954,340, Cl. 424-92.000.

Suto, Mark J., to Warner-Lambert Company. Haloalkylar-inomethyl-2-nitro-1H-imidazoles. 4,954,515, Cl. 514-398.000.

Sutrina, Thomas A.: *See*—
Crowe, Lawrence E.; and Sutrina, Thomas A., 4,954,876, Cl. 357-76.000.

Sutter, Marius; Boblendorf, Bettina; Bedorf, Norbert; and Hofle, Gerhard, to Gesellschaft fur Biotechnologische Forschung mbH; and Ciba-Geigy Corporation. Microeicides. 4,954,517, Cl. 514-450.000.

Suyama, Shuji; and Higuchi, Yoshiki, to Nippon Oil and Fats Company, Limited. Ester-type polymeric peroxides. 4,954,656, Cl. 568-567.000.

Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, to Sumitomo Chemical Company, Limited. Process for preparing trans-2,2-dimethyl-3-(2,2-dihalovinyl)-cyclopropane carboxylic acid halide. 4,954,651, Cl. 562-856.000.

Suzuki, Akira: *See*—
Iwase, Akira; and Suzuki, Akira, 4,953,965, Cl. 350-632.000.

Suzuki, Fujio, to Tel Sagami Limited. Apparatus for detecting an array of wafers. 4,954,721, Cl. 250-561.000.

Suzuki, Fumio; Iwasawa, Yoshihiro; Sato, Toshiaki; Ikai, Takasi; and Oguti, Toshiko, to Nissan Chemical Industries, Ltd. Pyrazolesulfonylurea derivatives, preparation thereof, herbicide containing said derivative as active ingredient and herbicidal method by use thereof. 4,954,164, Cl. 71-92.000.

Suzuki, Hideo: *See*—
Nakanishi, Keiichirou; Yamada, Minoru; Yamamoto, Masakazu; Ogihara, Satoru; Shinohara, Hiroichi; and Suzuki, Hideo, 4,954,877, Cl. 357-80.000.

Suzuki, Hidetoshi; and Nomura, Ichiro, to Canon Kabushiki Kaisha. Electron-emitting device and electron-beam generator making use. 4,954,744, Cl. 313-336.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Kawai, Yoshikazu; Sato, Chosuke; and Kato, Masaru, 4,953,649, Cl. 180-79.100.
Kimura, Fumikazu, 4,953,631, Cl. 165-41.000.

Suzuki, Kazumasa; Yamada, Masahiro; and Suzuki, Keiichiro, to Ishikawa Tekko Kabushiki Kaisha. Ball joint. 4,954,006, Cl. 403-135.000.

Suzuki, Kazunari: *See*—
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.

Suzuki, Keiichiro: *See*—
Suzuki, Kazumasa; Yamada, Masahiro; and Suzuki, Keiichiro, 4,954,006, Cl. 403-135.000.

Suzuki, Keita: *See*—
Minohara, Taketoshi; Takagi, Yoshio; Isobe, Tadashi; and Suzuki, Keita, 4,954,176, Cl. 106-417.000.

Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, to Canon Kabushiki Kaisha. Focus detecting apparatus provided with a plurality of detecting fields. 4,954,701, Cl. 250-201.800.

Suzuki, Koichi: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Suzuki, Koichi, 4,954,165, Cl. 71-103.000.

Suzuki, Kouichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.

Suzuki, Nobuo: *See*—
Yamakawa, Hideaki; Suzuki, Nobuo; and Ozeki, Takeshi, 4,954,786, Cl. 330-4.300.

Suzuki, Shinji: *See*—
Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, 4,955,082, Cl. 455-33.000.

Suzuki, Shintaro; Yanagisawa, Noriaki; and Ohkuma, Taka'aki, to Nippon Kayaku Kabushiki Kaisha. Lyophilized preparation of platinum compound. 4,954,522, Cl. 514-492.000.

Suzuki, Takahiro; Izuoka, Yuki; and Aoki, Noboru, to NGK Spark Plug Co., Ltd. Igniter plug structure having semicircular grooves. 4,954,743, Cl. 313-120.000.

Suzuki, Takamasa: *See*—
Yamaguchi, Masaya; and Suzuki, Takamasa, 4,954,993, Cl. 365-226.000.

Suzuki, Takaya: *See*—
Mimura, Akio; Hosokawa, Yoshikazu; Suzuki, Takaya; Aoyama, Takashi; Konishi, Nobutake; Misawa, Yutaka; and Miyata, Kenji, 4,954,855, Cl. 357-23.700.

Suzuki, Takeshi: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 4,954,523, Cl. 514-521.000.
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.

Suzuki, Yasuo: *See*—
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Suzuki, Yoshikazu: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.

Svagr, Alexander, to SMS Schloemann-Siemag Aktiengesellschaft. Device for guiding rolling material in a rolling mill stand of a structural mill. 4,953,380, Cl. 72-250.000.

Svecia Silkscreen Maskiner AB: *See*—
Ericsson, Sylve J. D., 4,953,459, Cl. 101-115.000.

Svenska Rotor Maskiner AB: *See*—
Karlsson, Kurt; and Pettersson, Birger, 4,953,629, Cl. 165-10.000.

Swan, Lee, to Equipment Development Company, Inc. Quick release mechanism for the tool of a concrete/asphalt abrader. 4,953,523, Cl. 125-14.000.

Swanson, Sally A.: *See*—
Ree, Moonhor; Swanson, Sally A.; Volksen, Willi; and Yoon, Do Y., 4,954,578, Cl. 525-432.000.
Swift, Gregory W.; Martin, Richard A.; and Radehaugh, Ray, to United States of America, Energy. Acoustic cryocooler. 4,953,366, Cl. 62-467.000.
Swindal, James L.: *See*—
Bullis, Robert H.; Swindal, James L.; Wiegand, Walter J., Jr.; Brahm, Charles B.; and Meyer, Harold D., 4,954,925, Cl. 361-283.000.
Swinderman, Robert T.: *See*—
Peterson, Edwin H.; Stetson, Harold M.; and Swinderman, Robert T., 4,953,689, Cl. 198-497.000.
Switchcraft, Inc.: *See*—
Frank, John J., 4,954,096, Cl. 439-346.000.
Swofford, Howard W.; Rice, Sandra W.; Farrar, Grover L.; and Rudd, David, to Hoechst Celanese Corporation. Polyester film coated in-line with an silane. 4,954,396, Cl. 428-340.000.
Synaptics Inc.: *See*—
Anderson, Janeen D. W.; and Mead, Carver A., 4,953,928, Cl. 357-23.500.
Szabo, Maria: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.
Szlaga, Emil, to Stant Inc. Tank pressure control valve. 4,953,583, Cl. 137-118.000.
Szucs, Robert M.; and Bright, Roy L. Load hauler. 4,954,030, Cl. 410-96.000.
T. D. Williamson, Inc.: *See*—
Rosenberg, Jeffrey S.; and Lockyear, Kevin W., 4,953,412, Cl. 73-865.800.
T K Valve Limited: *See*—
Steele, John, 4,953,587, Cl. 137-315.000.
Tabata, Kazufumi: *See*—
Araki, Nobuo; Tabata, Kazufumi; Yokoi, Kiyomi; and Ashidate Tadami, 4,953,827, Cl. 254-134.400.
Tabatabaei, Emad: *See*—
Fishman, Oleg; Prabhu, Satyen N.; Burk, John P.; and Tabatabaei, Emad, 4,953,761, Cl. 222-602.000.
Tabler, Donald C.: *See*—
Johnson, Marvin M.; and Tabler, Donald C., 4,954,467, Cl. 502-26.000.
Tabota, Jun, to Murata Manufacturing Co., Ltd. Pressure distribution detecting device. 4,953,410, Cl. 73-862.040.
Tachibana, Shunro; and Shibata, Uichi, to Tachibana, Shunro; and Meiji Seika Kaisha, Ltd. Endermic application kits for external medicines. 4,953,565, Cl. 128-798.000.
Tada, Atsushi. Manually operated trigger type dispenser, method of assembling the same, and a spinner for use in the dispenser. 4,953,791, Cl. 239-333.000.
Tadini, Giorgio: *See*—
Fogaroli, Giuseppe; Coli, Giuseppe; Tadini, Giorgio; and Meazza, Giampiero, 4,954,888, Cl. 358-75.000.
Taeckens, Sandra D. Method and means for supplying and using artificial fingernail material. 4,954,190, Cl. 156-61.000.
Tag Investments, Inc.: *See*—
Green, Raymond W., 4,954,271, Cl. 252-8.000.
Tagaya, Osamu: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Suzuki, Takeshi; Suzuki, Yoshikazu; Tagaya, Osamu; Suzuki, Kouichi; Abe, Kouichi; and Yamada, Kouji, 4,954,525, Cl. 514-549.000.
Taguchi, Nobuyoshi; Imai, Akihiro; Murata, Yukichi; and Hirota, Takao, to Matsushita Electric Industrial Co. Ltd.; and Mitsubishi Kasei Corporation. Thermal dye transfer sheet. 4,954,478, Cl. 503-227.000.
Tajima, Hatsuo: *See*—
Inoue, Masahiro; Tajima, Hatsuo; Sakemi, Yuji; and Okado, Kenji, 4,954,404, Cl. 430-45.000.
Taka, Toshio: *See*—
Kotani, Terumitsu; Taka, Toshio; and Saito, Yoshimasa, 4,954,391, Cl. 428-220.000.
Takada, Shigeyuki: *See*—
Yamamoto, Masaki; Takada, Shigeyuki; and Ogawa, Yasuaki, 4,954,298, Cl. 264-4.600.
Takagi, Jun: *See*—
Okubo, Tadahiko; Takagi, Jun; and Kohara, Tadashi, 4,953,800, Cl. 242-45.000.
Takagi, Junichi: *See*—
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.
Takagi, Kiyoharu; Tanikawa, Naoya; and Ikeda, Minoru, to Aisin Seiki Kabushiki Kaisha. Hydraulic accumulator. 4,953,591, Cl. 137-568.000.
Takagi, Yoshio: *See*—
Ito, Hiroshi; Handa, Junichi; Takagi, Yoshio; and Minohara, Taketoshi, 4,954,175, Cl. 106-417.000.
Minohara, Taketoshi; Takagi, Yoshio; Isobe, Tadashi; and Suzuki, Keita, 4,954,176, Cl. 106-417.000.
Takahashi, Hiroshi, to Canon Kabushiki Kaisha. Information processing apparatus. 4,954,967, Cl. 364-518.000.
Takahashi, Hiroshi, to Canon Kabushiki Kaisha. Light communication system. 4,955,081, Cl. 455-608.000.
Takahashi, Hiroshi: *See*—
Koike, Tadao; Noguchi, Koichi; Takahashi, Hiroshi; and Tsunoda, Koichi, 4,954,849, Cl. 355-319.000.
Takahashi, Hiroyuki; and Kurashima, Toshiaki, to Sanyo Kiki Kabushiki Kaisha; and Yokohama Aeroquip. Self-sealing coupling with bypass for hydraulic circuit. 4,953,592, Cl. 137-599.100.
Takahashi, Ippei; and Wakita, Takeshi, to Fuji Photo Film Co., Ltd. Disk surface inspection method and apparatus therefor. 4,954,723, Cl. 250-572.000.
Takahashi, Kazuya: *See*—
Nakamura, Yoshihiro; Takahashi, Kazuya; Ichinose, Atsuki; and Mino, Testuya, 4,954,906, Cl. 360-77.080.
Takahashi, Kenji: *See*—
Munesmura, Masahiro; and Takahashi, Kenji, 4,953,912, Cl. 296-191.000.
Takahashi, Mitsuo, to Seikoh Giken Co., Ltd. Optical fiber connecting device. 4,953,941, Cl. 350-96.200.
Takahashi, Sankichi: *See*—
Hayashi, Nobuatsu; Takahashi, Sankichi; Ebara, Katsuya; Kurokawa, Hideaki; Yamada, Akira; Koseki, Yasuo; Matsuzaki, Harumi; and Yoda, Hiroaki, 4,953,694, Cl. 202-180.000.
Takahashi, Takehiko; and Kato, Hitoshi, to Combi Co., Ltd. Baby carriage capable of serving as shopping car. 4,953,887, Cl. 280-647.000.
Takahashi, Tetsuhiko; Okajima, Kenichi; and Takeuchi, Hiroshi, to Hitachi, Ltd. Radiographic image pickup apparatus. 4,954,706, Cl. 250-327.200.
Takahashi, Toshiaki: *See*—
Hara, Kazuhiko; Takahashi, Toshiaki; and Nagura, Masato, 4,953,405, Cl. 73-602.000.
Takahira, Takashi: *See*—
Tatee, Tochiro; Takahira, Takashi; Yamashita, Kouwa; Sakurai, Masao; Shiozawa, Akira; and Narita, Kazuhisa, 4,954,642, Cl. 549-389.000.
Takai, Kazuhiko: *See*—
Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, 4,954,050, Cl. 417-269.000.
Takajo, Shigeaki; Furukimi, Osamu; Ogura, Kuniaki; Maruta, Keiichi; Abe, Teruyoshi; and Sakurada, Ichio, to Kawasaki Steel Corp. Composite alloy steel powder and sintered alloy steel. 4,954,171, Cl. 75-246.000.
Takamizawa, Minoru: *See*—
Takeda, Yoshifumi; Takamizawa, Minoru; and Takeno, Tsutomu, 4,954,596, Cl. 528-14.000.
Takano, Akira: *See*—
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Takano, Kazuhiro: *See*—
Isozaki, Masaaki; and Takano, Kazuhiro, 4,954,826, Cl. 341-100.000.
Takano, Shuntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, to Toyama Chemical Company, Ltd. 4H-1-benzopyran-4-one derivative or its salt, process for producing the same and pharmaceutical composition comprising the same as active ingredient. 4,954,518, Cl. 514-456.000.
Takano, Yoshihide: *See*—
Sakurai, Kenichi; and Takano, Yoshihide, 4,953,525, Cl. 123-41.280.
Takara Shuzo Co., Ltd.: *See*—
Yoshihama, Yoshio; Kagaya, Asuka; Matsui, Susumu; and Obayashi, Akira, 4,954,445, Cl. 435-191.000.
Takasago International Corporation: *See*—
Sayo, Noboru; Takemasa, Toshiro; and Kumobayashi, Hidenori, 4,954,644, Cl. 556-14.000.
Takase, Akihiko: *See*—
Iwata, Masayosi; Muto, Toahiya; Morikawa, Minoru; Kozawa, Satoshi; Takase, Akihiko; and Terano, Naoki, 4,954,675, Cl. 200-317.000.
Takata, Toshimasa; and Mizuno, Kenichi, to Mitsui Petrochemical Industries, Ltd. Epoxy resin. 4,954,603, Cl. 528-98.000.
Takatsu, Kiyoshi: *See*—
Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, 4,954,235, Cl. 204-273.000.
Takeda Chemical Industries, Ltd.: *See*—
Kamikado, Toshiya; Kando, Yasuyuki; Matsuura, Kazuho; and Yamada, Junji, 4,954,497, Cl. 514-235.500.
Sugihara, Hirosada; Nishikawa, Kohei; and Ito, Katsumi, 4,954,625, Cl. 540-500.000.
Yamamoto, Masaki; Takada, Shigeyuki; and Ogawa, Yasuaki, 4,954,298, Cl. 264-4.600.
Takeda, Masayuki: *See*—
Aoki, Takayoshi; and Takeda, Masayuki, 4,954,409, Cl. 430-108.000.
Takeda, Yoshifumi; Takamizawa, Minoru; and Takeno, Tsutomu, to Shin-Etsu Chemical Col, Ltd. Process for manufacturing organic silazane polymers and ceramics therefrom. 4,954,596, Cl. 528-14.000.
Takegawa, Yujiro, to Tsudakoma Kogyo Kabushiki Kaisha. Picking period setting device for a loom. 4,953,596, Cl. 139-435.100.
Takei, Hisashi: *See*—
Mochida, Mitsuyoshi; Maekawa, Tokuo; Takei, Hisashi; Matsumoto, Yasuo; Ohmura, Hiroshi; Sugimoto, Shigeru; Ushiro, Seimei; Asano, Seiji; and Yoshida, Toshio, 4,954,857, Cl. 354-75.000.
Takei, Tetsuya: *See*—
Hashizume, Junichiro; Takei, Tetsuya; Iida, Shigehira; Saitoh, Keishi; and Arai, Takayoshi, 4,953,498, Cl. 118-719.000.

Takemasa, Toshiro: *See*—
Sayo, Noboru; Takemasa, Toshiro; and Kumobayashi, Hidenori, 4,954,644, Cl. 556-14.000.

Takemura, Momoko; Inaba, Michihiko; Tetsuya, Toshio; and Kobayashi, Mitsuo, to Kabushiki Kaisha Toshiba. Semiconductor device. 4,954,870, Cl. 357-67.000.

Takeno, Ryuko: *See*—
Takano, Shuntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, 4,954,518, Cl. 514-456.000.

Takeno, Tsutomu: *See*—
Takeda, Yoshifumi; Takamizawa, Minoru; and Takeno, Tsutomu, 4,954,596, Cl. 528-14.000.

Takenouchi, Shinji, to Kabushiki Kaisha Toshiba. High frequency heating apparatus having sealable and detachable mounting rock. 4,954,680, Cl. 219-10.55E.

Takeshima, Eiki; Takatsu, Kiyoshi; Kojima, Youichi; and Fujii, Takahiro, to Nisshin Steel Co., Ltd. Electroplating of fine particles with metal. 4,954,235, Cl. 204-273.000.

Takeuchi, Hiroshi: *See*—
Takahashi, Tetsuhiko; Okajima, Kenichi; and Takeuchi, Hiroshi, 4,954,706, Cl. 250-327.200.

Takeuchi, Tomio: *See*—
Yoshimoto, Akihiro; Jodo, Osamu; Watanabe, Yoshio; Okamoto, Rokuro; and Takeuchi, Tomio, 4,954,438, Cl. 435-78.000.

Takita, Kazuyuki, to International Business Machines Corporation. Head positioning control method and system. 4,954,907, Cl. 360-78.070.

Takiyama, Masahiro; Miyazaki, Kunihiro; and Shiozawa, Kenichiro, to Showa Denko Kabushiki Kaisha; and Chiyoda Kaushiki Kaisha. Polishing pad for semiconductor wafers. 4,954,141, Cl. 51-296.000.

Takuma, Keisuke; Ohyama, Tsukasa; Ghoda, Isamu; Mikoda, Tamio; Koshida, Hitoshi; and Igata, Akitoshi, to Mitsui Toatsu Chemicals, Incorporated. Color toner composition. 4,954,410, Cl. 430-109.000.

Tallman, Brett C. Protective cover for eyeglasses. 4,953,695, Cl. 206-5.000.

Tamm, Rolf, to Bodenseewerk Perkin-Elmer & Co., GmbH. Electrothermal atomization furnace. 4,953,977, Cl. 356-312.000.

Tamura, Takemi. Gas lighter. 4,954,077, Cl. 431-145.000.

Tanabe, Toshiyuki; and Senoo, Seiji, to Kabushiki Kaisha Toshiba. Reception control apparatus for a television receiver. 4,954,899, Cl. 358-191.100.

Tanaka, Hirotoshi; Yamashita, Hiroki; Masuda, Noboru; Shigeta, Junji; Umemoto, Yasunari; and Kagaya, Osamu, to Hitachi, Ltd. Semiconductor integrated circuit memory. 4,954,866, Cl. 357-45.000.

Tanaka, Keiichi: *See*—
Takano, Shuntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, 4,954,518, Cl. 514-456.000.

Tanaka Kikinzoku Kogyo K.K.: *See*—
Tsurumi, Kazunori; Nakamura, Toshihide; and Sato, Akira, 4,954,474, Cl. 502-185.000.

Tanaka, Koichi: *See*—
Taniguchi, Kouji; Ogura, Takashi; and Tanaka, Koicji, 4,954,746, Cl. 313-506.000.

Tanaka, Koosuke: *See*—
Kawashima, Masaei; Naka, Reishi; Tsunoda, Teruo; Suenaga, Nobuyoshi; Ogawa, Syozo; Kashiwabuchi, Masaaki; Kameda, Miyakichi; and Tanaka, Koosuke, 4,954,465, Cl. 502-5.000.

Tanaka, Norio: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; Watanabe, Shigeomi; and Suzuki, Koichi, 4,954,165, Cl. 71-103.000.

Tanaka, Tadashi: *See*—
Mizunoya, Nobuyuki; Komorita, Hiroshi; Tanaka, Tadashi; and Matsumura, Kazuo, 4,954,386, Cl. 428-137.000.

Tanaka, Tomiji: *See*—
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Tanaka, Tomomi: *See*—
Sugata, Yoshinobu; Furusho, Noboru; and Tanaka, Tomomi, 4,954,405, Cl. 430-58.000.

Tandem Mfg., Inc.: *See*—
Sudakoff, Carle H.; and Matthews, Billie D., 4,953,880, Cl. 280-47.380.

Tanemura, Fumikazu; Honda, Tohru; Ohta, Shigetoshi; Kajita, Yoshiharu; and Kachi, Tatsushi, to Mino Yogyo Co., Ltd. Water-permeable ceramic material. 4,954,460, Cl. 501-80.000.

Tanguy, Christian: *See*—
Kervagoret, Gilbert; and Tanguy, Christian, 4,953,445, Cl. 91-358.00A.

Tani, Sumio; Kogoh, Kazuhiko; Nozaki, Yuri; and Oshima, Kunihiro, to Kurashiki Boseki Kabushiki Kaisha. Porous polymer particles and preparation method thereof. 4,954,399, Cl. 428-402.000.

Taniguchi, Kouji; Ogura, Takashi; and Tanaka, Koicji, to Sharp Kabushiki Kaisha. Thin film electroluminescence displaying apparatus. 4,954,746, Cl. 313-506.000.

Taniguchi, Takashi: *See*—
Satou, Hiroshi; Utsui, Yoshihiko; Tuneyoshi, Kiyotugu; Taniguchi, Takashi; Haraga, Kousuke; and Tsukui, Keitarou, 4,954,215, Cl. 156-630.000.

Tanikawa, Naoya: *See*—
Takagi, Kiyoharu; Tanikawa, Naoya; and Ikeda, Minoru, 4,953,591, Cl. 137-568.000.

Tanimizu, Akihiro, to Mitsubishi Denki Kabushiki Kaisha. Color display apparatus. 4,954,880, Cl. 358-17.000.

Tanimoto, Kenzo, to NEC Corporation. Error correction control system for control memory. 4,955,023, Cl. 371-40.100.

Tanji, Masaki: *See*—
Nishijima, Toyoki; and Tanji, Masaki, 4,954,431, Cl. 430-546.000.

Tarlow, Kenneth A. Collapsible steamer basket. 4,953,452, Cl. 99-344.000.

Tasaki, Takanobu: *See*—
Hironaka, Yoshiaki; Matsubayashi, Tatsuhiko; Kamata, Yoshikiyo; and Tasaki, Takanobu, 4,953,526, Cl. 123-182.000.

Tashima, Masatoshi: *See*—
Iguchi, Kazuyoshi; Tashima, Masatoshi; Tazi, Ryoichi; Yoshino, Soichi; and Yagi, Motoo, 4,954,734, Cl. 310-71.000.

Tatee, Tochiro; Takahira, Takashi; Yamashita, Kouwa; Sakurai, Masao; Shiozawa, Akira; and Narita, Kazuhisa, to Nippon Kayaku Kabushiki Kaisha. Forskolin compounds. 4,954,642, Cl. 549-389.000.

Tateishi, Terutaka; Koshino, Minoru; and Shimizu, Kazuyuki, to Fujitsu Limited. Method and circuit for checking storage protection by pre-checking an access request key. 4,954,982, Cl. 364-900.000.

Tatsumi, Eiji: *See*—
Noji, Toshiyuki; Yoshida, Hidetoshi; Tatsumi, Eiji; Akao, Shinichi; and Kosaka, Hideyuki, 4,953,330, Cl. 52-167.0DF.

Tatsuno, Yujiro: *See*—
Nakane, Keiichi; Kuwabara, Tadashi; Ikeda, Naoya; Koreeda, Hiroyuki; Aotsu, Hiroaki; Kawase, Masaki; Tatsuno, Yujiro; Nonaka, Naomichi; and Suzuki, Kazunari, 4,954,818, Cl. 340-721.000.

Taub, Howard H.: *See*—
West, William J.; Taub, Howard H.; and Miller, Robert J., 4,953,287, Cl. 29-611.000.

Taxmo Co., Ltd.: *See*—
Hashimoto, Isao; and Hidehira, Tsuyoshi, 4,954,842, Cl. 346-139.00R.

Taylor, David W.: *See*—
Hartridge, Leonard S. G.; Taylor, David W.; and Waters, Roger L., 4,954,368, Cl. 427-256.000.

Taylor, Dennis R.: *See*—
Vrooman, Carll D.; and Taylor, Dennis R., 4,953,664, Cl. 186-59.000.

Taylor, Ian A., to Moorman Manufacturing Company. Animal feeder. 4,953,504, Cl. 119-54.000.

Taylor, Paul D.: *See*—
Liu, Kou-Chang; and Taylor, Paul D., 4,954,582, Cl. 525-502.000.

Taylor, Sidney A.; and Rogala, Stanely J., to CRC-Evans Pipeline International, Inc. High pressure water jet cleaner and coating applicator. 4,953,496, Cl. 118-72.000.

Tazi, Mohammed: *See*—
Chuang, Jui-Chang; Walls, Edward, Jr.; Johnson, Stephen C.; and Tazi, Mohammed, 4,954,336, Cl. 424-71.000.

Tazi, Ryoichi: *See*—
Iguchi, Kazuyoshi; Tashima, Masatoshi; Tazi, Ryoichi; Yoshino, Soichi; and Yagi, Motoo, 4,954,734, Cl. 310-71.000.

TD Quilting Machinery: *See*—
Brower, David; and Jernigan, Thomas K., 4,953,483, Cl. 112-119.000.
Brower, David; and Jernigan, Thomas K., 4,953,485, Cl. 112-262.300.

Tech/Ops Landauer, Inc.: *See*—
Wheeler, Robert V., 4,954,716, Cl. 250-482.100.

Tecon GmbH: *See*—
Vogelpohl, Alfons; and Rabiger, Norbert, 4,954,257, Cl. 210-607.000.

Teel, Willis A.; and Christoff, James T., to United States of America, Navy. Double phase-lock-loop sonar. 4,954,999, Cl. 367-97.000.

Teijin Petrochemical Industries, Ltd.: *See*—
Onodera, Tamio; Sakai, Tokuji; Yamasaki, Yasuo; and Sumitani, Koji, 4,954,326, Cl. 423-328.000.

Tektronix, Inc.: *See*—
Klingman, Kayla R., 4,954,983, Cl. 364-900.000.
Vancil, Bernard K., 4,954,745, Cl. 313-446.000.

Tel Sagami Limited: *See*—
Aoki, Kazutsugu; Fuse, Noboru; and Sakamoto, Yoshio, 4,954,684, Cl. 219-390.000.
Suzuki, Fujio, 4,954,721, Cl. 250-561.000.
Yamaga, Kenichi, 4,954,079, Cl. 432-6.000.

Telchin, Arthur. Self examination device. 4,953,970, Cl. 351-223.000.

Telefonaktiebolaget L M Ericsson: *See*—
Ghisler, Walter, 4,955,049, Cl. 379-58.000.
Roos, Sture G., 4,954,674, Cl. 200-175.000.

Telkes, Maria: *See*—
MacCracken, Calvin D.; and Telkes, Maria, 4,954,278, Cl. 252-70.000.

Tennessee Gas Pipeline Company: *See*—
Jewell, Raymond S., Jr.; and Hill, William E., 4,953,660, Cl. 181-282.000.

Tennessee Valley Authority: *See*—
Elrod, Jimmie L.; and Lee, Robert G., 4,954,155, Cl. 71-28.000.
Gautney, Joe; Worley, Shelby D.; and Ash, Doris H., 4,954,156, Cl. 71-28.000.
Harrison, Cecil P.; and Tittle, Cullen G., 4,954,134, Cl. 23-313.00R.

Tennihan, Robert. Leaf disposal bag. 4,955,068, Cl. 383-4.000.

Terada, Takami: *See*—
Yamada, Yukifumi; Terada, Takami; and Hibino, Keiichi, 4,953,676, Cl. 192-8.00C.

Terakado, Seishi: *See*—
Ishii, Kazunori; Terakado, Seishi; Funakoshi, Yasutomo; and Sakairi, Tadashi, 4,954,696, Cl. 219-548.000.

Terane, Hideyuki; and Nakagawa, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Priority order decomposing apparatus. 4,954,978, Cl. 364-715.100.

Terano, Naoki: *See*—
Iwata, Masayosi; Muto, Toahiya; Morikawa, Minoru; Kozawa, Satoshi; Takase, Akihiko; and Terano, Naoki, 4,954,675, Cl. 200-317.000.

Terao, Motoyasu: *See*—
Nishida, Tetsuya; Terao, Motoyasu; Miyauchi, Yasushi; and Horigome, Shinkichi, 4,954,379, Cl. 428-64.000.

Terashima, Shigeo: *See*—
Fuji, Hiroshi; Yamaguchi, Takeshi; Kojima, Kunio; Deguchi, Toshihisa; Terashima, Shigeo; and Fujiwara, Tsuneo, 4,954,903, Cl. 360-46.000.

Terauchi, Kiyoshi: *See*—
Higuchi, Teruo; Terauchi, Kiyoshi; Takai, Kazuhiko; Kikuchi, Sei; and Kobayashi, Hideto, 4,954,050, Cl. 417-269.000.

Terayama, Satoshi: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Shimada, Hiroyuki; Kikuchi, Kimihiko; and Nakayama, Hiroshi, 4,953,677, Cl. 192-3.300.

Tersiev, Valentin S., to TK "Orgtechnika" . Wind measuring system (anemorhumbometer). 4,953,402, Cl. 73-189.000.

Terui, Hiroshi, to Canon Kabushiki Kaisha. Pattern detecting method and apparatus. 4,955,062, Cl. 382-8.000.

Tervamaki, Jukka, to Labsystems Oy. Washing device. 4,953,575, Cl. 134-57.00R.

Teshima, Takashi: *See*—
Nishibayashi, Katsumi; and Teshima, Takashi, 4,954,411, Cl. 430-111.000.

Teti, George J.: *See*—
Stiver, C. Edward; Teti, George J.; Pearson, Charles S., and Brown, Kenneth R., 4,953,383, Cl. 72-402.000.

Tetsuya, Toshio: *See*—
Takemura, Momoko; Inaba, Michihiko; Tetsuya, Toshio; and Kobayashi, Mitsuo, 4,954,870, Cl. 357-67.000.

Texas Instruments Incorporated: *See*—
Colombat, Hubert, 4,954,977, Cl. 364-710.030.
Hashimoto, Masahi, 4,954,994, Cl. 365-230.060.
Ishikawa, Shuichi; and Kuwano, Hiromichi, 4,954,766, Cl. 323-272.000.
McMann, Ronald E.; Garcia, Evaristo, Jr.; Welch, Michael T.; and Thompson, Stephen W., 4,954,423, Cl. 430-316.000.
Penz, Perry A.; and Gately, Michael T., 4,954,963, Cl. 364-513.000.
Reid, Lee R., 4,954,458, Cl. 437-51.000.
Sampsell, Jeffrey B., 4,954,789, Cl. 330-4.300.

Thakore, Yatin B.; and Stoy, Vladimir, to Kingston Technologies. Filled membranes for separation of polar from non-polar gases. 4,954,145, Cl. 55-16.000.

Thalken, Charles R.: *See*—
Phillips, William R.; Bush, Blaine A.; O'Brien, John J.; and Thalken, Charles R., 4,953,610, Cl. 160-84.100.

Theisler, Charles W. Adjustable thumb brace. 4,953,568, Cl. 128-87R.000.

Thellier, Michel: *See*—
Alexandre, Stephane; Thellier, Michel; and Vincent, Jean-Claude, 4,954,261, Cl. 210-638.000.

Theobald, Hans; Becker, Rainer; and Himmele, Walter, to BASF Aktiengesellschaft. Isoxazolines as intermediates to furans. 4,954,633, Cl. 548-240.000.

Theodoridis, George, to FMC Corporation. Phosphorylaminophenyltetrahydrophthalimide herbicides. 4,954,159, Cl. 71-86.000.

Thermal Dynamics Corporation: *See*—
Hatch, Bruce O., 4,954,683, Cl. 219-121.500.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track surfacing machine with track stabilization. 4,953,467, Cl. 104-7.100.

Thill, Bruce P.; and King, Bruce A., to Dow Chemical Company, The. Polyalkyloxazoline-polycarbonate-polyalkyloxazoline triblock copolymer compatibilizer for polycarbonate/polyamide blends. 4,954,579, Cl. 525-467.000.

Thomas & Betts Corporation: *See*—
Lanzetta, Carmen, Jr.; Kieli, Michael; Schindler, Guenter; and Williams, Russell H., 4,953,940, Cl. 350-96.200.

Thomas Regout N.V.: *See*—
Wojcik, Hendrigus T., 4,953,990, Cl. 384-18.000.

Thomassen, Egidius T. R., to Du Pont de Nemours, E. I., and Company. Press-fit electrical terminal. 4,954,104, Cl. 439-751.000.

Thomassen, Thomas, to Cheminuest, A.S. Drum electrolysis. 4,954,228, Cl. 204-105.00R.

Thomassen, Thomas, to Cheminvest A.S. Drum electrolysis. 4,954,234, Cl. 204-212.000.

Thompson, Glen F.: *See*—
Litton, Ernest C., Sr.; and Thompson, Glen F., 4,953,316, Cl. 42-90.000.

Thompson, Jay A.: *See*—
Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,955,024, Cl. 371-40.100.

Thompson, Stanley C.; and Fredericks, Elmer R. Golf swing training device. 4,953,868, Cl. 273-186.00A.

Thompson, Stephen W.: *See*—
McMann, Ronald E.; Garcia, Evaristo, Jr.; Welch, Michael T.; and Thompson, Stephen W., 4,954,423, Cl. 430-316.000.

Thompson, Winnie C.: *See*—
Wright, Amy E.; Thompson, Winnie C.; and Lui, May S., 4,954,527, Cl. 514-675.000.

Thomson-CSF: *See*—
Buisson, Jean-Michel; and Soubrier, Jean-Marie, 4,954,767, Cl. 323-283.000.
Warnan, Francois, 4,954,110, Cl. 441-22.000.

Thomson Hybrides et Microondes: *See*—
Tung, Pham N., 4,954,827, Cl. 341-159.000.

Thorell, Lennart, to Boxholm Produktion AB. Method and apparatus for cutting and deburring tubes. 4,953,377, Cl. 72-70.000.

Thornton, Allison A.: *See*—
Thornton, Michael R.; and Thornton, Allison A., 4,953,731, Cl. 217-56.000.

Thornton, Michael R.; and Thornton, Allison A. Keyless locking apparatus for selectively securing a lid to a box. 4,953,731, Cl. 217-56.000.

Thyssen Edelstahlwerke AG: *See*—
Schumers, Werner, 4,953,613, Cl. 164-416.000.

Tien, Ping K.: *See*—
Alferness, Rodney C.; Eisenstein, Gadi; Koren, Uziel; Tien, Ping K.; Tucker, Rodney S.; and Whalen, Matthew S., 4,955,028, Cl. 372-20.000.

Timberlake, John F.: *See*—
Gerkin, Richard M.; and Timberlake, John F., 4,954,561, Cl. 524-728.000.

Tinz, Reinhard: *See*—
Beicht, Bernd; Tinz, Reinhard; and Heinemann, Joachim, 4,953,514, Cl. 123-520.000.

Tisbo, Cosmo N.; and Mack, Robert J., to Custom Plastics, Inc. Container movable from flat to channel-shaped configuration. 4,953,735, Cl. 220-6.000.

Tittle, Cullen G.: *See*—
Harrison, Cecil P.; and Tittle, Cullen G., 4,954,134, Cl. 23-313.00R.

TK "Orgtechnika" : *See*—
Tersiev, Valentin S., 4,953,402, Cl. 73-189.000.

Tobey, Billy D. Hand-holdable tube cutting device. 4,953,292, Cl. 30-97.000.

Tobimatsu, Noriaki, to Sony Corporation. Cassette loading apparatus with improved access. 4,954,916, Cl. 360-96.500.

Tobioka, Takashi: *See*—
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, 4,954,858, Cl. 354-145.100.

Toda, Kunio: *See*—
Oka, Tateki; Toyoshi, Naoki; and Toda, Kunio, 4,954,843, Cl. 355-210.000.

Todokoro, Shinji: *See*—
Kokubun, Yoshikazu; Kurosawa, Akihito; Ushikubo, Kohei; and Todokoro, Shinji, 4,954,697, Cl. 235-381.000.

Tohru, Hoshi: *See*—
Mizuhara, Noboru; Tohru, Hoshi; and Morita, Takashi, 4,955,019, Cl. 370-85.700.

Tokico Ltd.: *See*—
Imaizumi, Tomio, 4,953,671, Cl. 188-299.000.
Komori, Teruyuki; Miyake, Shingo; and Senoo, Yoshio, 4,954,536, Cl. 523-149.000.

Toko, Inc.: *See*—
Kasahara, Takeshi, 4,954,850, Cl. 357-14.000.

Tokyo Electric Co., Ltd.: *See*—
Shiozaki, Tsugio; Kitahara, Satoshi; Koizumi, Osamu; and Sugiura, Ikuzo, 4,953,994, Cl. 400-120.000.

Tokyo Electric Power Company Ltd., The: *See*—
Hattori, Seiji; Kasukawa, Akihide; Shibano, Yoshizo; Kobayashi, Yoshinobu; and Suzuki, Shinji, 4,955,082, Cl. 455-33.000.

Tokyo Electron Limited: *See*—
Kumagai, Hiromi; Sato, Kaoru; and Imai, Yoshio, 4,954,685, Cl. 319-390.000.

Tokyo Keiki Company Ltd.: *See*—
Kakinuma, Toshifumi; and Hayashi, Kiyoshi, 4,953,590, Cl. 137-554.000.

Tokyo Magnetic Printing Co., Ltd.: *See*—
Kawashima, Norimichi; and Orii, Kazuya, 4,954,140, Cl. 51-295.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Miura, Yasuaki, 4,954,874, Cl. 357-74.000.

Toledano, Abraham, to Ilco Unican Inc. Key removable core body. 4,953,373, Cl. 70-369.000.

Tolmie, Robert J., Jr.; and Dolan, Donald T., to Pitney Bowes Inc. Mail thickness measuring apparatus. 4,953,842, Cl. 271-2.000.

Tomaka, Leonard P.; and Dreyfus, Larry M. Combination serving tray, bed tray and bathtub tray. 4,953,473, Cl. 108-132.000.

Tomar Electronics, Inc.: *See*—
Sikora, Scott T., 4,954,753, Cl. 315-219.000.

Tomco Incorporated: *See*—
Killion, Robert F.; and Wolfe, Michael J., 4,953,518, Cl. 123-568.000.

Tomeraasen, Paul L.: *See*—
Miller, Steven D.; McDonald, Joseph C.; Eichner, Fred N.; and Tomeraasen, Paul L., 4,954,707, Cl. 250-337.000.

Tominari, Noboru, to Dynavector, Inc. Reverb generator. 4,955,057, Cl. 381-63.000.

Tomljenovic, Nenad, to Asea Brown Boveri Ltd. Method of generating an amplitude-modulated ISB transmission signal and apparatus for carrying out the method. 4,955,072, Cl. 455-108.000.

Tomoegawa Paper Co., Ltd.: *See*—
Kobayashi, Yasuo; Hagiwara, Naoki; Hirota, Taisuke; Kodama, Churyo; Hirasawa, Yasuo; Miyazaki, Katsumi; Kawamura, Fumio; Higashi, Takao; Yanagisawa, Masami; and Sei, Akinori, 4,954,937, Cl. 362-255.000.

Tomordi, Elemer: *See*—
Besenyei, Gabor; Nemeth, Sandor; Simandi, Laszlo ; Belak, Maria; Szabo, Maria; Dukai, Jozsef; Nagy, Lajos; Tomordi, Elemer; Soptei, Csaba; and Dioszegine, Erzsebet E., 4,954,628, Cl. 544-211.000.

Tone, Junsuke: *See*—
Maeda, Hiroshi; Tone, Junsuke; Ruddock, John C.; and Holdom, Kelvin S., 4,954,482, Cl. 514-8.000.

Tone, Shoichi; and Kirtake, Masaharu, to Murata Kikai Kabushiki Kaisha. Winding unit. 4,953,798, Cl. 242-35.50R.

Tonn, Howard E.; Davidson, Robert; Shultz, David B.; and Miller, Keith R., to Co-Ordinated Railway Services, Inc,. Piston and shaft assembly of railroad end-of-car cushioning devices and method of repairing same. 4,953,727, Cl. 213-8.000.

Topputo, Michael: *See*—
Marino, John G.; and Topputo, Michael, 4,953,267, Cl. 24-682.000.

Toray Engineering Co., Ltd.: *See*—
Okubo, Tadahiko; Takagi, Jun; and Kohara, Tadashi, 4,953,800, Cl. 242-45.000.

Tordoff, Michael G.: *See*—
Friedman, Mark I.; Tordoff, Michael G.; DiNovi, Michael J.; and Rafka, Robert J., 4,954,531, Cl. 514-738.000.

Torii, Hideo: *See*—
Aoki, Masaki; Torii, Hideo; Kuribayashi, Kiyoshi; Monji, Hideto; Umetani, Makoto; and Fujii, Eiji, 4,953,385, Cl. 72-462.000.

Torii, Kiyofumi: *See*—
Shikama, Takashi; Wakabayashi, Asami; and Torii, Kiyofumi, 4,954,692, Cl. 219-365.000.

Torii, Nobutoshi; and Otsuka, Kazuhisa, to Fanuc Ltd. Industrial robot swivel shaft apparatus. 4,953,992, Cl. 384-607.000.

Torikai, Eiichi: *See*—
Kato, Hiroshi; and Torikai, Eiichi, 4,954,238, Cl. 204-430.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Iwamoto, Norihiro, 4,954,063, Cl. 425-149.000.

Toshiba Machine Company, Ltd.: *See*—
Iwase, Akira; and Suzuki, Akira, 4,953,965, Cl. 350-632.000.

Tousignant, James W.: *See*—
Tousignant, Robert C.; Tousignant, James W.; and Tousignant, Richard L., 4,953,752, Cl. 222-23.000.

Tousignant, Richard L.: *See*—
Tousignant, Robert C.; Tousignant, James W.; and Tousignant, Richard L., 4,953,752, Cl. 222-23.000.

Tousignant, Robert C.; Tousignant, James W.; and Tousignant, Richard L., to E-Con-Mega Mix. Concrete and mortar distribution process and apparatus. 4,953,752, Cl. 222-23.000.

Town, Michael H.: *See*—
Skuballa, Werner; Radtechel, Bernd; Vorbrueggen, Helmut; Casals-Stenzel, Jorge; Mannesmann, Gerda; Schillinger, Ekkehard; and Town, Michael H., 4,954,524, Cl. 514-530.000.

Toyama Chemical Company, Ltd.: *See*—
Takano, Shuntaro; Yoshida, Chosaku; Inaba, Takihiro; Tanaka, Keiichi; Takeno, Ryuko; Nagaki, Hideyoshi; Shimotori, Tomoya; and Makino, Shinji, 4,954,518, Cl. 514-456.000.

Toyo Engineering Corporation: *See*—
Okuyama, Nobuhisa; Goto, Shiuichi; and Enomoto, Tsugio, 4,954,047, Cl. 417-203.000.

Toyoshi, Naoki: *See*—
Oka, Tateki; Toyoshi, Naoki; and Toda, Kunio, 4,954,843, Cl. 355-210.000.

Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, to Menicon Co., Ltd; and Shin-Etsu Chemical Co., Ltd. Soft ocular lens material. 4,954,586, Cl. 526-245.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Ito, Hiroshi; Handa, Junichi; Takagi, Yoshio; and Minohara, Taketoshi, 4,954,175, Cl. 106-417.000.
Kobayashi, Katsuyuki, 4,954,120, Cl. 464-141.000.
Minohara, Taketoshi; Takagi, Yoshio; Isobe, Tadashi; and Suzuki, Keita, 4,954,176, Cl. 106-417.000.

Trailstar Mfg. Corp.: *See*—
Johnston, William T.; Smith, Leslie, Jr.; and Barker, David K., 4,954,039, Cl. 414-500.000.

Trani, Aldo: *See*—
Malabarba, Adriano; Strazzolini, Paolo; Trani, Aldo; Magni, Ambrogio; and Cavalleri, Bruno, 4,954,483, Cl. 514-9.000.

Transitions Research Corporation: *See*—
Evans, John M., Jr.; Weiman, Carl F. R.; and King, Steven J., 4,954,962, Cl. 364-513.000.

Transpirator Technologies, Inc.: *See*—
Blackmer, Richard H.; and Hedman, Jonathan W., 4,953,546, Cl. 128-203.160.

Tremblay, Raymond, to Les Entrepots Dupont et Lanctot Inc. Ash trays. 4,953,571, Cl. 131-231.000.

Tremulis, William S., to Advanced Cardiovascular Systems, Inc. Pressure monitoring guidewire with a flexible distal portion. 4,953,553, Cl. 128-637.000.

Trevelas, Chris A.: *See*—
Fandrich, Darrell G.; and Trevelas, Chris A., 4,953,433, Cl. 84-239.000.

Trewiler, Carl E., to General Electric Company, The. Method of making drill back-up material for small bore drilling of circuit boards. 4,954,200, Cl. 156-344.000.

Tribert, Claude; and Grat, Felix R., to Howden Food Equipment, Inc. Method and apparatus for transferring a predetermined portion to a container. 4,953,600, Cl. 141-1.000.

Tridon Limited: *See*—
Chow, Simon S. M., 4,953,251, Cl. 15-250.320.

Trinkaus, Karl, to Wella Aktiengesellschaft. One-piece plastic clip. 4,953,266, Cl. 24-499.000.

Tripp, Victor: *See*—
Harms, Frank M.; Tripp, Victor; and Wells, Thomas B., 4,954,679, Cl. 219-10.55M.

Trombetta, Thomas L. Electrician's compound tool. 4,953,248, Cl. 7-107.000.

Troncoso, Vincent F.; and Gangloff, Richard, to Golden Key-Futura, Inc. Archery bow assembly. 4,953,521, Cl. 124-24.100.

Trozpek, Ludd A., to Rockwell International Corporation. Pathlength control system with deformable mirror having liquid-filled housing. 4,954,700, Cl. 250-201.900.

Truehart, David C.: *See*—
Dahlquist, E. Arthur; Jenkins, Allan D.; Truehart, David C.; and Baxter, Richard B., 4,954,041, Cl. 414-718.000.

Truini, Jacqueline G.: *See*—
Davis, Paul D.; Schuster, Gary B.; Truini, Jacqueline G.; and Fentiman, Al, 4,954,415, Cl. 430-138.000.

TRW Ehrenreich GmbH & Co. KG: *See*—
Broszat, Lothar; Servos, Michael; and Schnitzler, Dieter, 4,953,894, Cl. 280-846.000.

TRW Inc.: *See*—
Klosterhaus, Edwin G., 4,953,653, Cl. 180-148.000.
Ubhayakar, Shivadev K., 4,953,961, Cl. 350-486.000.
Ubhayakar, Shivadev K.; and Baker, Robert D., 4,954,952, Cl. 364-513.000.

TRW United Carr GmbH & Co. KG: *See*—
Kraus, Willibald, 4,953,742, Cl. 220-367.000.

TS AGRO Products IM-Export B.V.: *See*—
Meester, Jacobus, 4,953,712, Cl. 209-669.000.

Tsaur, Sheng-Liang, to S. C. Johnson & Son, Inc. Resin-fortified emulsion polymers and methods of preparing the same. 4,954,558, Cl. 525-460.000.

Tsay, Yung-Hsing: *See*—
Chen, Chung-Mei; Yang, Jenn Fu; Lee, Weng-Jay; Lin, Tsai-Sheng; and Tsay, Yung-Hsing, 4,953,710, Cl. 209-518.000.

Tschang, Chung-Ji: *See*—
Oftring, Alfred; Tschang, Chung-Ji; Winkler, Ekhard; Gotsmann, Guenther and Glaser, Klaus, 4,954,369, Cl. 427-430.100.

Tsirjulnikov, Moisei V.; and Zusmanovsky, Zinovy A. Device for treatment of sexual impotence in human males. 4,953,542, Cl. 128-79.000.

Tsubota, Toshio: *See*—
Yoshida, Mitsutoshi; Tsubota, Toshio; and Okumura, Hiroshi, 4,954,043, Cl. 414-719.000.

Tsuchihashi, Masaru: *See*—
Shindo, Koji; and Tsuchihashi, Masaru, 4,954,065, Cl. 425-175.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Takegawa, Yujiro, 4,953,596, Cl. 139-435.100.

Tsuge, Hisanao: *See*—
Kawabata, Shoichi; Tsuge, Hisanao; and Wakatsuki, Hiromichi, 4,953,283, Cl. 29-593.000.

Tsuji, Eiji; and Nakano, Hideharu, to Matsushita Electric Works, Ltd. Hair curler with a clamping member. 4,953,574, Cl. 132-232.000.

Tsujikawa, Akira: *See*—
Maeda, Haruhisa; Tsujikawa, Akira; and Susumi, Sadao, 4,954,340, Cl. 424-92.000.

Tsujimura, Osamu; Arai, Tatsuo; and Saito, Takayoshi, to Mitsubishi Metal Corporation. Inserted rotary cutter. 4,954,021, Cl. 407-35.000.

Tsukada, Tokio: *See*—
Shinnai, Masao; Nishikawa, Kazuya; Tsukada, Tokio; and Hirotsu, Tohru, 4,954,797, Cl. 343-704.000.

Tsukada, Toru, to Nippon Seiko Kabushiki Kaisha. Linear guide apparatus with clamp device. 4,953,988, Cl. 384-8.000.

Tsukui, Keitarou: *See*—
Satou, Hiroshi; Utsui, Yoshihiko; Tuneyoshi, Kiyotugu; Taniguchi, Takashi; Haraga, Kousuke; and Tsukui, Keitarou, 4,954,215, Cl. 156-630.000.

Tsumura, Tomoki, to PFU Limited. System for processing various types of information in easily usable form. 4,954,969, Cl. 364-521.000.

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Lehtonen, Kari, 4,953,415, Cl. 74-141.000.
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Ma, Frank; and Comesu, Daniel, 4,954,279, Cl. 252-70.000.
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Army: *See*—
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Hales, Walter L., 4,953,981, Cl. 356-353.000.
Hester, Troy L., 4,953,804, Cl. 242-47.000.
Hunter, Kenneth W.; and Fischer, Gerald W., 4,954,449, Cl. 435-240.270.
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Neifeld, Richard A., 4,954,365, Cl. 427-53.100.
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Swift, Gregory W.; Martin, Richard A.; and Radehaugh, Ray, 4,953,366, Cl. 62-467.000.
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Keefer, Larry K., 4,954,526, Cl. 514-611.000.
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Evans, Alan G.; and Stein, William L., 4,954,833, Cl. 342-357.000.
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Gilbreath, Gail C.; and Clement, Anne E., 4,953,951, Cl. 350-320.000.
Goldman, Warren A., 4,955,003, Cl. 367-125.000.
Hightower, Ralph E., 4,953,465, Cl. 102-406.000.
Hunter, Paul; and Schwee, Leonard J., 4,954,216, Cl. 156-634.000.
Moscrip, William M., 4,953,440, Cl. 89-7.000.
Munach, Arnold S.; and Nguyen, John Q., 4,953,475, Cl. 102-229.000.
Olson, Jack R.; Hitney, Herbert V.; Paulus, Richard A.; and Anderson, Kenneth D., 4,953,986, Cl. 374-136.000.
Teel, Willis A.; and Christoff, James T., 4,954,999, Cl. 367-97.000.
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Chung, Kah-Seng, 4,955,078, Cl. 455-244.000.
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Anafi, David; and Slaymaker, Philip A., 4,953,964, Cl. 350-557.000.

Bullis, Robert H.; Swindal, James L.; Wiegand, Walter J., Jr.; Brahm, Charles B.; and Meyer, Harold D., 4,954,925, Cl. 361-283.000.
Suchoski, Paul G., Jr.; Findaklly, Talal K.; and Leonberger, Frederick J., 4,953,935, Cl. 350-96.160.
Young, Edward L.; and Kapoor, Mohan L., 4,954,752, Cl. 315-169.300.
Unitek Corporation: *See*—
Kelly, John S.; and Gille, Henrick K., 4,954,080, Cl. 433-8.000.
Universal Consolidated Methods, Inc.: *See*—
Yoder, Ronald L., 4,953,820, Cl. 248-231.500.
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Schurch, Samuel, 4,953,389, Cl. 73-64.400.
University of California, The Regents of the: *See*—
Nevins, Donald J.; and Nishitani, Kazuhiko, 4,954,447, Cl. 435-200.000.
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Johnson, Christy L.; Schwank, Johannes; and Wise, Kensall D., 4,953,387, Cl. 73-25.030.
University of Missouri, The Curators of the: *See*—
Davis, Robert L.; and Keith, Harold D., 4,954,017, Cl. 405-259.000.
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Starr, Robert C.; and Ingleton, Robert A., 4,953,637, Cl. 175-20.000.
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UOP: *See*—
Gatsis, John G., 4,954,473, Cl. 502-171.000.
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Yoshida, Haruo; Uotani, Nobuo; and Saida, Yoshihiro, 4,954,590, Cl. 526-259.000.
Urai, Takahiko, to NEC Corporation. Output buffer circuit used for stable voltage source. 4,954,729, Cl. 307-443.000.
Urakami, Toyozo, to Sanyo Electric Co., Ltd. Reference signal producing circuit for phase servo control. 4,954,893, Cl. 358-148.000.
Urata, Yukihide, to Fuji Photo Film Co., Ltd. Silver halide color photographic material for laser recording. 4,954,429, Cl. 430-503.000.
Urban, Frank J., to Pfizer Inc. Process for optically active 3-(methanesulfonyloxy) thiolane and analogs. 4,954,647, Cl. 558-46.000.
Uremovich, Michael J. Hydrocarbon reclaimer system. 4,954,267, Cl. 210-771.000.
Urvantsev, Anatoly I.; Elantsev, Jury S.; Komlev, Alexei M.; Kusembaev, Saliman K.; Stepanov, Jury I.; and Vasiliev, Viktor P. Electrical drum-type separator. 4,954,248, Cl. 209-127.100.
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US Molding Machinery Company: *See*—
Cohen, Zachariha, 4,954,074, Cl. 425-556.000.
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Usui, Masayoshi, 4,953,896, Cl. 285-197.000.
Usui, Masayoshi, to Usui Kokusai Sangyo Kaisha Ltd. Structure for connecting branch pipe in high-pressure fuel manifold. 4,953,896, Cl. 285-197.000.
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Clayton, Dennis A., 4,953,481, Cl. 110-342.000.
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Vancil, Bernard K., to Tektronix, Inc. Cathode structure. 4,954,745, Cl. 313-446.000.
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Amstutz, Douglas D.; and Vanderboegh, Ronald A., 4,955,044, Cl. 362-125.000.
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van der Weide, Jouke; and Hoogeboom, Adrianus J. T., to Necam B.V. Intelligent control of motor vehicle gas equipment. 4,953,516, Cl. 123-527.000.
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Dotson, Jimmy R., 4,954,300, Cl. 264-36.000.
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Jensen, Michael L.; Nolf, Jean-Marie E.; Vansant, Jan; and Mendes, Luiz N., 4,954,670, Cl. 174-92.000.
Van Steenborgh, Leon R. Safety refrigerant storage cylinder. 4,953,357, Cl. 62-45.100.
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Urvantsev, Anatoly I.; Elantsev, Jury S.; Komlev, Alexei M.; Kusembaev, Saliman K.; Stepanov, Jury I.; and Vasiliev, Viktor P., 4,954,248, Cl. 209-127.100.
Vasseur, Adrian, Jr. Fishing rod holder. 4,953,318, Cl. 43-21.200.
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Pfalzgraf, Manfred; Hickmann, Gerd; and Mausner, Eberhard, 4,953,529, Cl. 123-396.000.
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Vegso, Lajos, to Bristol Corporation. Vacuum breaker valve. 4,953,584, Cl. 137-218.000.
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Schmidt, William J., 4,953,759, Cl. 222-402.200.
Verstraten, Markus, to Pella B.V. Partition wall consisting of double-walled panels coupled pivotally to each other. 4,953,611, Cl. 160-199.000.
Vetter, Ulrich, to Schaudt Maschinenbau GmbH. Method of dressing grinding wheels in grinding machines. 4,953,522, Cl. 125-11.010.
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Critton, Thomas J.; Johnson, Donald S.; Pukalo, Walter P.; and Yorio, Ralph, 4,953,778, Cl. 228-173.600.
Victor Company of Japan, Ltd.: *See*—
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Viellard, Paul H. Method of fabricating golf clubs and assembly of tubes for forming clubs obtained by the method. 4,954,198, Cl. 156-294.000.
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Vigano, Tullio U.: *See*—
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Virginio, Lerza. Antibacterial protective element for microphones and telephone receivers, and package containing said element. 4,953,703, Cl. 206-451.000.

Virta, Raimo: *See—*
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Virving, Nils, to Sunds Defibrator Aktiebolag. Refiner segment. 4,953,796, Cl. 241-298.000.

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Visser, James T., to Granco Clark, Inc. Extrusion puller with stripper finger. 4,953,381, Cl. 72-257.000.

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Pfeiffer, David M.; Stoner, David T.; Norsworthy, John P.; Dipert, Dwight D.; Thompson, Jay A.; Fontaine, James A.; and Corry, Michael K., 4,955,024, Cl. 371-40.100.

VLSI Technology, Inc.: *See—*
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Voest-Alpine Maschinenbau Gesellshaft m.b.H.: *See—*
Oswald, Johannes R.; and Guggenberger, Eduard, 4,953,814, Cl. 246-382.000.

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Vogelpohl, Alfons; and Rabiger, Norbert, to Tecon GmbH. Biological purification loop device and method having deflector plate within guide pipe. 4,954,257, Cl. 210-607.000.

Vogt, Harald: *See—*
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Volksen, Willi: *See—*
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Volpe, Vincent: *See—*
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von Berg, Peter, to Peter Von Berg Extrakorporale Systeme Medizintechnik. Flow control. 4,953,594, Cl. 137-614.180.

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Ward, Andrew H., to Dow Corning Corporation. Transparent antiperspirant compositions and method of preparation. 4,954,333, Cl. 424-66.000.

Ward, Dale. Prophylactic device for use with a telephone. 4,953,567, Cl. 128-851.000.

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Warnan, Francois, to Thomson-CSF. Underwater buoy provided with hydrodynamic stabilizing means and designed to be suspended, notably from a helicopter. 4,954,110, Cl. 441-22.000.

Warner, David M. Tool to assist attaching fabric top to vehicle body. 4,953,903, Cl. 294-1.100.

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Warwick, Jack A. Modular overpass or raised parking structure. 4,953,249, Cl. 14-2.400.

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Wassen, Charles, to Valeo Vision. Device for adjusting the aiming direction of a motor vehicle headlight. 4,954,933, Cl. 362-66.000.
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Weatherup, Clifford R., to EEV Limited. Thyratron gas discharge device with magnetic field for improved ionization. 4,954,748, Cl. 313-153.000.
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Wei, Lee-Fang, to AT&T Bell Laboratories. Efficient connection arrangements for multihop networks. 4,955,021, Cl. 370-124.000.
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Buck, Daniel C., 4,954,834, Cl. 342-360.000.
Collins, William G., Jr., 4,953,480, Cl. 110-246.000.
Fey, Maurice G.; Iyer, Natraj C.; Male, Alan T.; and Lovic, William R., 4,954,170, Cl. 75-229.000.
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Williamson, David M. Optical reduction system. 4,953,960, Cl. 350-442.000.
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Shibukawa, Takeo, 4,953,438, Cl. 84-609.000.

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Yanagita, Mitsuhiro: *See*—
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Yang, Jenn Fu: *See*—
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Yasufuku, Hitoshi; and Ogata, Toshikazu, to Kabushiki Kaisha Toshiba. Ventilator drive system. 4,953,784, Cl. 236-44.00A.
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Ozaki, Keiichi; Manabe, Naoki; Shibata, Tatsumi; Hayashi, Hideharu; Muramatsu, Yukio; and Yamamoto, Masaki, 4,954,102, Cl. 439-535.000.
Shimochi, Eiji, 4,954,090, Cl. 439-76.000.
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Eng, Kai Y.; Karol, Mark J.; and Yeh, Yu S., 4,955,017, Cl. 370-60.000.
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Yializis, Angelo, to Spectrum Control, Inc. Flash evaporation of monomer fluids. 4,954,371, Cl. 427-44.000.
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Yoder, Ronald L., to Universal Consolidated Methods, Inc. Lamp with retaining ring. 4,953,820, Cl. 248-231.500.
Yoh, Kanji, to Leland Stanford Junior University, The Board of Trustees of the. Complementary FET circuit having merged enhancement/depletion FET output. 4,954,730, Cl. 307-451.000.
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Yokohama Aeroquip: *See*—
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Yokohama Rubber Co., Ltd., The: *See*—
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Yokoi, Kiyomi: *See*—
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Yokoyama, Takaaki, to Sanken Electric Co., Ltd. Method for manufacturing plastic encapsulated electronic semiconductor devices. 4,954,307, Cl. 264-272.150.
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Yoshida, Hajime, to Nikken Chemical Laboratory Co., Ltd. Lipophobicating solution for electrophotographic plates for offset printing. 4,954,173, Cl. 106-2.000.
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Yoshida, Hidemi: *See*—
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Yoshida, Kazuomi; Higuchi, Hideyo; Mizuochi, Hitoshi; and Yamamoto, Yousuke, to Mitsubishi Denki Kabushiki Kaisha. Optical semiconductor device. 4,954,853, Cl. 357-17.000.
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Yoshihama, Yoshio; Kagaya, Asuka; Matsui, Susumu; and Obayashi, Akira, to Takara Shuzo Co., Ltd. Novel NAD(P)H oxidase. 4,954,445, Cl. 435-191.000.
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Yoshino, Takehito: *See*—
Amada, Hiroshi; Aoike, Tatsuyuki; Yoshino, Takehito; and Okamura, Ryuji, 4,954,397, Cl. 430-58.000.
Yoshioka, Hidetoshi; Kojima, Eiji; Ishida, Shuji; Yoshioka, Hiroyuki; and Murakami, Kunichika, to Sanyo-Kokusaku Pulp Co., Ltd. 2',3'-dideoxy-4-thio-uridine derivatives, process for their preparation and antivirus agents using them. 4,954,485, Cl. 514-49.000.
Yoshioka, Hiroshi: *See*—
Toyoshima, Nobuyuki; Shibata, Takanori; Hirashima, Atsushi; Ando, Ichiro; Iwata, Noriko; Yoshioka, Hiroshi; Itagaki, Akinari; and Yamazaki, Toshio, 4,954,586, Cl. 526-245.000.
Yoshioka, Hiroyuki: *See*—
Yoshioka, Hidetoshi; Kojima, Eiji; Ishida, Shuji; Yoshioka, Hiroyuki; and Murakami, Kunichika, 4,954,485, Cl. 514-49.000.
Yoshioka, Masanobu: *See*—
Maeda, Kouzo; Yoshioka, Masanobu; and Hikone, Makoto, 4,953,423, Cl. 74-552.000.
Yoshiura, Tsukasa: *See*—
Wakabashi, Noriaki; Yoshida, Shuichi; Inaji, Toshio; Onodera, Hiromi; Yoshiura, Tsukasa; and Mitani, Hiroshi, 4,954,905, Cl. 360-77.030.
Yost, David A.; Russell, John C.; and Yang, Heechung, to Abbott Laboratories. Non-metal colloidal particle immunoassay. 4,954,452, Cl. 436-524.000.
Young, Douglas G.: *See*—
Lipman, Kenneth; and Young, Douglas G., 4,954,726, Cl. 307-46.000.
Young, Edward L.; and Kapoor, Mohan L., to United Technologies Corporation. Row driver for EL panels and the like with transformer coupling. 4,954,752, Cl. 315-169.300.
Young, James R.: *See*—
Katsuki, Kazuo; Peppers, Norman A.; Young, James R.; Pierce, Gerald A.; and Nishi, Hisami, 4,955,060, Cl. 382-32.000.

Young, Robert N.; Rokach, Joshua; and Hayes, Edward C., to Merck Frosst Canada, Inc.; and Merck & Co., Inc. Leukotriene by amides and hydrazides. 4,954,638, Cl. 548-546.000.

Young, Vance W., Jr.: *See*—
Jorgensen, Robert W.; Young, Vance W., Jr.; and Misenar, Scott L., 4,953,898, Cl. 285-340.000.

Yu, Eugene L.: *See*—
Natusch, Paul J.; Yu, Eugene L.; Senerchia, David C.; and Henry, John F., Jr., deceased, 4,954,946, Cl. 364-200.000.

Yuasa, Eiji: *See*—
Shuku, Shigekazu; Mukoyoshi, Shunichiro; Yuasa, Eiji; and Yamori, Tsunefumi, 4,954,477, Cl. 503-226.000.

Zabrecky, James R.: *See*—
Beck, Anton K.; Withy, Raymond M.; Zabrecky, James R.; and Masiello, Nicholas C., 4,954,437, Cl. 435-69.400.

Zahir, Sheik A., to Ciba-Geigy Corporation. Epoxysiloxanes. 4,954,580, Cl. 525-476.000.

Zaitoun, Hanna. Temporary, reusable, movable hull patch for a damaged oil tanker. 4,953,491, Cl. 114-229.000.

Zambre, Samuel: *See*—
Lo, Ying-Ching; Zambre, Samuel; and Escorcio, Tolentino, 4,954,960, Cl. 364-484.000.

Zanke, Dieter: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,954,495, Cl. 514-231.200.

Zastinge, Johan M., to Wewler N.V. Connecting structure for connecting a spring axle suspension to a vehicle chassis. 4,953,891, Cl. 280-788.000.

Zavacki, Eugene C.: *See*—
Fazzolari, Luciano; Giattini, Frank P.; Scoca, Anthony L.; and Zavacki, Eugene C., 4,954,996, Cl. 367-13.000.

Zawadzki, Andrzej: *See*—
Jacob, Allan S.; and Zawadzki, Andrzej, 4,954,973, Cl. 364-551.010.

Zaweski, Edward F.; and Jolly, James G. Sulfurized olefin extreme pressure additives. 4,954,274, Cl. 252-45.000.

Zehrung, Scott A.: *See*—
Nieman, Gerald R.; Clyatt, Clarence L., III; Paulus, Eric J.; Zehrung, Scott A.; Ragl, Albert; and Moore, John R., 4,954,794, Cl. 333-182.000.

Zeidler, Dennis E.: *See*—
Zeidler, Douglas D.; and Zeidler, Dennis E., 4,953,863, Cl. 273-113.000.

Zeidler, Douglas D.; and Zeidler, Dennis E. Game assembly. 4,953,863, Cl. 273-113.000.

Zelin, Michael P.: *See*—
Lauks, Imants R.; and Zelin, Michael P., 4,954,087, Cl. 439-71.000.

Zelli, Joseph M., to Breston, Michael P., a part interest. Sloping rotatable exerciser. 4,953,858, Cl. 272-146.000.

Zelson, Larry S.: *See*—
Fioravanti, Kenneth J.; Zelson, Larry S.; and Baukal, Charles E., Jr., 4,954,076, Cl. 431-116.000.

Zembrowski, William J.: *See*—
Mylari, Banavara L.; and Zembrowski, William J., 4,954,629, Cl. 544-237.000.

Zerhouni, Elias; and Parish, David M., to Resonex, Inc.; and Johns Hopkins University. Magnetic resonance imaging method. 4,953,554, Cl. 128-653.00A.

Ziegenhain, William C., to Du Pont de Nemours, E. I., and Company. Process for purifying hydrogen fluoride. 4,954,330, Cl. 423-484.000.

Ziegler, Hermann; Handte, Horst; Braun, Walter; and Gutzeit, Horst, to Dr. Ing. h.c.F. Porsche AG. Stationary window arrangement at a motor vehicle door. 4,953,331, Cl. 52-208.000.

Zigler, Arie; Eisen, Yosset; and Eisen, Yossef, to Apti, Inc. High resolution directional gamma ray detector. 4,954,709, Cl. 250-385.100.

Zimmerman, Wolfgang. Electrically heated pin-point gate. 4,954,072, Cl. 425-549.000.

Zinser, Georg, to Albert Handtmann, Maschinenfabrik GmbH & Co. KG. Machine for processing meat. 4,953,262, Cl. 17-1.00R.

Zinser Textilmaschinen GmbH: *See*—
Schulz, Gunter; Probst, Frieder; and Guttler, Hermann, 4,953,350, Cl. 57-354.000.

Zoller, Wilhelm: *See*—
Payer, Wolfgang; Buhnen, Heinz D.; and Zoller, Wilhelm, 4,954,594, Cl. 526-320.000.

Zollfrank nee Baumann, Gerlinde: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank nee Baumann, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 4,954,495, Cl. 514-231.200.

Zone Industrielle d'Epluches: *See*—
Leboime, Pierre, 4,953,647, Cl. 180-9.100.

Zouzoulas, John, to Mars Incorporated. Compact, low power gate apparatus for coin operated machines. 4,953,681, Cl. 194-346.000.

Zsold, Tibor. Method and apparatus for an optimized multiparameter flow-through particle and cell analyzer. 4,954,715, Cl. 250-461.100.

Zuehlke, Art G: *See*—
Becker, Thomas K.; Casavant, Terry S.; Helm, P. Ralph; Petzold, Terry L.; Wanek, Michael J.; and Zuehlke, Art G, 4,953,722, Cl. 212-156.000.

Zuk, David M., to Environmental Research Institute of Michigan. Range dispersion sensor. 4,953,972, Cl. 356-4.000.

Zulehner, Werner: *See*—
Hahn, Peter; Piontek, Hubert; Schnegg, Anton; and Zulehner, Werner, 4,954,189, Cl. 148-33.200.

Zundel, Jean-Pol: *See*—
Eibner, Jules A.; and Zundel, Jean-Pol, 4,954,979, Cl. 364-900.000.

Zur, Yuval, to Elscint Ltd. Correction for eddy current caused phase degradation. 4,954,779, Cl. 324-306.000.

Zurn Industries, Inc.: *See*—
Durante, Joseph L., 4,954,034, Cl. 414-156.000.

Zurwelle, Donald W., to Black & Decker, Inc. Screwdriver bit and chuck key retainer. 4,954,026, Cl. 408-241.00R.

Zusmanovsky, Zinovy A.: *See*—
Tsirjulnikov, Moisei V.; and Zusmanovsky, Zinovy A., 4,953,542, Cl. 128-79.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF SEPTEMBER, 1990

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beckman, John: *See*—
Sills, David; and Beckman, John, Re. 33,322, Cl. 464-162.000.

Dana Corporation: *See*—
Sills, David; and Beckman, John, Re. 33,322, Cl. 464-162.000.

Diener, Horst, to Vita Zahnfabrik H. Rauter GmbH & Co. Dispenser for pasty compositions. Re. 33,319, Cl. 220-253.000.

Edwards, Harper, McNew & Co.: *See*—
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., Re. 33,324, Cl. 305-35.00R.

Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., to Edwards, Harper, McNew & Co. Endless drive system. Re. 33,324, Cl. 305-35.00R.

Exxon Research & Engineering Company: *See*—
Roarty, John C.; and Nadler, Murray, Re. 33,323, Cl. 208-79.000.

Hareng, Michel: *See*—
Magarino, Jose; Szydlo, Nicholas; Hareng, Michel; and Landouar, Pierre, Re. 33,321, Cl. 350-333.000.

Harper, Daniel R.: *See*—
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., Re. 33,324, Cl. 305-35.00R.

Kondo, Hideya: *See*—
Yokoyama, Yoichi; and Kondo, Hideya, Re. 33,325, Cl. 335-14.000.

Landouar, Pierre: *See*—
Magarino, Jose; Szydlo, Nicholas; Hareng, Michel; and Landouar, Pierre, Re. 33,321, Cl. 350-333.000.

Magarino, Jose; Szydlo, Nicholas; Hareng, Michel; and Landouar, Pierre. Process for the production of a substrate for an electrically controlled device and display screen produced from such a substrate. Re. 33,321, Cl. 350-333.000.

Matsushita Electric Works, Ltd.: *See*—
Yokoyama, Yoichi; and Kondo, Hideya, Re. 33,325, Cl. 335-14.000.

McNew, Quinton B.: *See*—
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., Re. 33,324, Cl. 305-35.00R.

Nadler, Murray: *See*—
Roarty, John C.; and Nadler, Murray, Re. 33,323, Cl. 208-79.000.

Roarty, John C.; and Nadler, Murray, to Exxon Research & Engineering Company. Reforming process for enhanced benzene yield. Re. 33,323, Cl. 208-79.000.

Sills, David; and Beckman, John, to Dana Corporation. Drive line slip joint assembly. Re. 33,322, Cl. 464-162.000.

Szydlo, Nicholas: *See*—
Magarino, Jose; Szydlo, Nicholas; Hareng, Michel; and Landouar, Pierre, Re. 33,321, Cl. 350-333.000.

Vita Zahnfabrik H. Rauter GmbH & Co.: *See*—
Diener, Horst, Re. 33,319, Cl. 220-253.000.

Yokoyama, Yoichi; and Kondo, Hideya, to Matsushita Electric Works, Ltd. Remotely controllable circuit breaker. Re. 33,325, Cl. 335-14.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Byrd, Kerry, to University Vectors Corporation. Work-saving system for preventing loss in a computer due to power interruption. B1 4,763,333, 9-4-90, Cl. 371-66.000.

Davies, Joseph R. Roller electrodes for electric-resistance welding machine. B1 4,780,589, 9-4-90, Cl. 219-84.000.

Eckerle, Joseph S. High efficiency electrical power conditioner. B1 4,042,890, 9-4-90, Cl. 330-207.00A.

Garner-Gray, Peter F., to Lever Brothers Company. Solid detergent composition containing sodium perborate monohydrate having specified surface area. B1 4,539,131, 9-4-90, Cl. 252-99.000.

Lever Brothers Company: *See*—
Garner-Gray, Peter F., B1 4,539,131, Cl. 252-99.000.

University Vectors Corporation: *See*—
Byrd, Kerry, B1 4,763,333, Cl. 371-66.000.

LIST OF DESIGN PATENTEES

Adriaansen, David L.: *See*—
Brefka, Paul E.; Adriaansen, David L.; and Greystone, Steven E., 310,357, Cl. D14-113.000.

Afeyan Industries Inc.: *See*—
Afeyan, Levon, 310,313, Cl. D6-604.000.

Afeyan, Levon, to Afeyan Industries Inc. Air mattress. 310,313, 9-4-90, Cl. D6-604.000.

Akaike, Kazuo; Kobayashi, Masahiko; Utsunomiya, Osamu; Takahashi, Ryuichi; and Takayasu, Tetsufumi, to Kokusai Electric Co., Ltd. Portable radio telephone. 310,366, 9-4-90, Cl. D14-138.000.

Al-Heyari, Salem A. S. Game board. 310,393, 9-4-90, Cl. D21-32.000.

Allen, Keith R.; Crawford, Jeffrey; and Rule, Geoffrey, to Sigma Air Conditioning Pty, Limited. Air conditioning unit. 310,409, 9-4-90, Cl. D23-351.000.

Allred, Darrin D. Lense cover for insertion in the recessed areas of the dashboard instrument panel for prevention of dust and dirt buildup. 310,346, 9-4-90, Cl. D12-192.000.

Alsup, James D., Jr.: *See*—
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,410, Cl. D23-354.000.
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,411, Cl. D23-354.000.

American Standard Inc.: *See*—
Stairs, Henry M., Jr., 310,407, Cl. D23-301.000.

Anema, Willem, to U.S. Philips Corporation. Electric shaver. 310,429, 9-4-90, Cl. D28-51.000.

Angerer, Michael. Combination truck bed liner and convertible cushion unit. 310,343, 9-4-90, Cl. D12-98.000.

Atsuumi, Masaru: *See*—
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 310,348, Cl. D13-114.000.

Au, Nelson S.: *See*—
Nuttall, Michael J.; and Au, Nelson S., 310,358, Cl. D14-113.000.

Austin, Andrew G.: *See*—
Moriconi, David P.; and Austin, Andrew G., 310,354, Cl. D14-109.000.

Avia Group International, Inc.: *See*—
Selbiger, Lawrence, 310,291, Cl. D2-314.000.
Selbiger, Lawrence, 310,292, Cl. D2-314.000.

Baader, Joseph E. Auxiliary vehicle dual warning light. 310,424, 9-4-90, Cl. D26-35.000.

Backman, Sture, to Sandvik Aktiebolag. Hand saw. 310,318, 9-4-90, Cl. D8-95.000.

Bain, Charles E., to Bell & Howell Company. Character indicia encoding desk for mail. 310,351, 9-4-90, Cl. D14-103.000.

Barrett, Larry G.: *See*—
Bernacchi, Peter J.; and Barrett, Larry G., 310,324, Cl. D8-399.000.

Barron, Peter B.; Weaver, Allan; and Maas, Margaret /., to Digital Equipment Corporation. Video monitor. 310,356, 9-4-90, Cl. D14-113.000.

Beaman, Robert E.; and Clark, Willis F., to Laughner Brothers, Inc. Building. 310,420, 9-4-90, Cl. D25-22.000.

Bell & Howell Company: *See*—
Bain, Charles E., 310,351, Cl. D14-103.000.

Bell & Howell Publication Systems Company: *See*—
Nuttall, Michael J.; and Au, Nelson S., 310,358, Cl. D14-113.000.

Belim, Howard G., to Lifeline Limited. Gas delivery mask. 310,431, 9-4-90, Cl. D29-8.000.

Benz Electronic Co., Ltd.: *See*—
Shih, Hsiu-Chen, 310,430, Cl. D28-49.000.

Bergen, David A.: *See*—
Bergen, Melody A.; and Bergen, David A., 310,311, Cl. D6-500.000.

Bergen, Melody A.; and Bergen, David A. Sunshade attachment for a chair or similar article. 310,311, 9-4-90, Cl. D6-500.000.

Bernacchi, Peter J.; and Barrett, Larry G., to Insul-Mark, Midwest, Inc. Roof fastening plate. 310,324, 9-4-90, Cl. D8-399.000.

Besasie, Joseph C., to Toyogo, Inc. Electronic game. 310,390, 9-4-90, Cl. D21-13.000.

Bigler, William E.; Cherepak, Michael S.; Collister, Kenneth D.; and Postma, Cynthia S., to Miles Inc. Sample processor. 310,413, 9-4-90, Cl. D24-17.000.

Biological Control Systems Ltd.: *See*—
Wyatt, Tristram D.; and Jones, Owen T., 310,402, Cl. D22-122.000.

Bitel, Vincent J., to Rogers Manufacturing Company, The. Food service tray. 310,315, 9-4-90, Cl. D7-554.000.

Black & Decker Inc.: *See*—
Gierke, Martin P.; and Straub, Robert P., 310,437, Cl. D32-15.000.

Bloom, Kenneth H.: *See*—
Scott, Robert P.; and Bloom, Kenneth H., 310,371, Cl. D14-258.000.

Boochard, E. L., to Jackson Products, Inc. Welding helmet. 310,432, 9-4-90, Cl. D29-9.000.

Borden France S.A.: *See*—
Thieser, Gerhard, 310,398, Cl. D21-130.000.

Boucher, Pamela B.; and Brown, Paul D., to Reebok International Ltd. Shoe sole. 310,295, 9-4-90, Cl. D2-320.000.

Breece, William N. Motorcycle helmet with light. 310,434, 9-4-90, Cl. D29-13.000.

Brefka, Paul E.; Adriaansen, David L.; and Greystone, Steven E., to Computer Sports Systems, Inc. Cathode ray tube monitor. 310,357, 9-4-90, Cl. D14-113.000.

Brickner, Louis C.; McKee, Michael P.; Wilson, Raymond L.; and Hollinger, David N., Jr., to Delta International Machinery Corp. Motorized saw unit. 310,375, 9-4-90, Cl. D15-133.000.

Briggs, Stephen W., III. Tape retainer for endotracheal tube. 310,414, 9-4-90, Cl. D24-34.000.

Broderick, James M.; and Lewis, E. Leonard. Three compartment pastry bag. 310,317, 9-4-90, Cl. D7-700.000.

Brookman, Larry W. Wall outlet guard. 310,319, 9-4-90, Cl. D8-350.000.

Brown, Paul D.: *See*—
Boucher, Pamela B.; and Brown, Paul D., 310,295, Cl. D2-320.000.
Serna, Ralph; and Brown, Paul D., 310,293, Cl. D2-314.000.

Burns, Stephen R., to Ryobi Motor Products Corp. Vacuum cleaner. 310,438, 9-4-90, Cl. D32-22.000.

Burrow, Tommy J. Eyeglass holder. 310,301, 9-4-90, Cl. D3-34.000.

Butcher, Ian: *See*—
Hillman, Kevin P.; and Butcher, Ian, 310,285, Cl. D1-102.000.

California Optical Leather, Inc.: *See*—
Marks, Robert J.; and Eaken, William L., 310,300, Cl. D3-34.000.

Canon Kabushiki Kaisha: *See*—
Fukushima, Hiroyuki, 310,298, Cl. D3-33.000.
Inukai, Yoshinori, 310,359, Cl. D14-113.000.
Ito, Hitomi, 310,299, Cl. D3-33.000.
Omino, Seiichi; and Kanno, Takuma, 310,383, Cl. D18-1.000.

Carlsen, Edgar O. Combined container and drinking straw. 310,326, 9-4-90, Cl. D9-337.000.

Carmichael, William H. Security box for vehicles and the like. 310,304, 9-4-90, Cl. D3-40.000.

Caron, Richard J. Car seat cover. 310,314, 9-4-90, Cl. D6-611.000.

Cassini, Oleg L., to Oleg Cassini, Inc. Fragrance bottle. 310,330, 9-4-90, Cl. D9-410.000.

Charles Beseler Company: *See*—
Howitt, George L., 310,297, Cl. D3-33.000.

Charles, Jeffrey R. Multiple function image switching attachment for a telescope or similar article. 310,381, 9-4-90, Cl. D16-136.000.

Cherepak, Michael S.: *See*—
Bigler, William E.; Cherepak, Michael S.; Collister, Kenneth D.; and Postma, Cynthia S., 310,413, Cl. D24-17.000.

Chippenhook, Inc.: *See*—
Crawford, Dennis; and Rutherford, Barry, 310,388, Cl. D20-10.000.

Cifaldi, Rocco. Adjustable unit for a hand shower or the like. 310,406, 9-4-90, Cl. D23-263.000.

Clark, Willis F.: *See*—
Beaman, Robert E.; and Clark, Willis F., 310,420, Cl. D25-22.000.

Cleveland, Floyd M., to Virgo Industries, Inc. Dog handler. 310,435, 9-4-90, Cl. D30-152.000.

College Marie-Victorin: *See*—
Leblanc, France, 310,391, Cl. D21-17.000.

Colletti, Peter. Car seat tray. 310,303, 9-4-90, Cl. D3-40.000.

Collister, Kenneth D.: *See*—
Bigler, William E.; Cherepak, Michael S.; Collister, Kenneth D.; and Postma, Cynthia S., 310,413, Cl. D24-17.000.

Computer Sports Systems, Inc.: *See*—
Brefka, Paul E.; Adriaansen, David L.; and Greystone, Steven E., 310,357, Cl. D14-113.000.

Contour, Inc.: *See*—
Moglianesi, Carlos J.; Falco, Mark; and Peoples, Leslie, 310,307, Cl. D4-104.000.

Covington, Jay C.: *See*—
Scognamillo, Frank; and Covington, Jay C., 310,305, Cl. D3-61.000.

Crawford, Dennis; and Rutherford, Barry, to Chippenhook, Inc. Holder for display signs or the like. 310,388, 9-4-90, Cl. D20-10.000.

Crawford, Jeffrey: *See*—
Allen, Keith R.; Crawford, Jeffrey; and Rule, Geoffrey, 310,409, Cl. D23-351.000.

Crookes, William E.: *See*—
Westimayer, David A.; Crookes, William E.; and Nickles, Daniel R., 310,374, Cl. D15-15.000.

Cureton, Earl E. Timer mechanism for a wildlife feeder motor. 310,338, 9-4-90, Cl. D10-40.000.

Davis, Matthew, to North American Philips Corp. Portable television receiver/monitor. 310,362, 9-4-90, Cl. D14-126.000.

Deere & Company: *See*—
Westimayer, David A.; Crookes, William E.; and Nickles, Daniel R., 310,374, Cl. D15-15.000.

Delta International Machinery Corp.: *See*—
Brickner, Louis C.; McKee, Michael P.; Wilson, Raymond L.; and Hollinger, David N., Jr., 310,375, Cl. D15-133.000.

Derhaag, Robert L.; and Kutz, Donald A., to H.M. Electronics, Inc. Wireless microphone. 310,368, 9-4-90, Cl. D14-228.000.

DesignTime Company Limited: *See*—
Fong, Wa N., 310,333, Cl. D10-32.000.

Dideriksen, Erling T., to Interlego A.G. Toy trailer hitch element. 310,399, 9-4-90, Cl. D21-141.000.

Digital Equipment Corporation: *See*—
Barron, Peter B.; Weaver, Allan; and Maas, Margaret A., 310,356, Cl. D14-113.000.

Dinand, Pierre, to Euroitalia S.r.l. Cosmetic bottle. 310,328, 9-4-90, Cl. D9-385.000.

D'Innocente, Ralph; and Pauls, James R., to Jacuzzi Whirlpool Bath. SPA step unit. 310,415, 9-4-90, Cl. D24-38.000.

DMV Corporation: *See*—
England, Robert C., 310,380, Cl. D16-124.000.

Dobies, Mark A.: *See*—
Repasky, Carol M.; and Dobies, Mark A., 310,370, Cl. D14-258.000.

Dockery, Devan. Remote control adapter. 310,367, 9-4-90, Cl. D14-217.000.

Donian, Anthony F. Protective cover for electrical outlet. 310,320, 9-4-90, Cl. D8-350.000.

Eaken, William L.: *See*—
Marks, Robert J.; and Eaken, William L., 310,300, Cl. D3-34.000.

Eastman Kodak Company: *See*—
Wingate, Barry; and Esslinger, Hartmut H., 310,382, Cl. D16-209.000.

England, Robert C., to DMV Corporation. Contact lens remover. 310,380, 9-4-90, Cl. D16-124.000.

Eriksson, Gunder W.; and Nordenskjold, Kjell, to Telefonaktiebolaget LM Ericsson. Combination handset telephone and stand. 310,365, 9-4-90, Cl. D14-138.000.

Esslinger, Hartmut H.: *See*—
Wingate, Barry; and Esslinger, Hartmut H., 310,382, Cl. D16-209.000.

Euroitalia S.r.l.: *See*—
Dinand, Pierre, 310,328, Cl. D9-385.000.

Falco, Mark: *See*—
Moglianesi, Carlos J.; Falco, Mark; and Peoples, Leslie, 310,307, Cl. D4-104.000.

Farina, Piero. Slip-on shoe. 310,289, 9-4-90, Cl. D2-283.000.

Filtertek, Inc.: *See*—
Nauseda, Lavergne; and Leason, Hayden, 310,421, Cl. D25-113.000.

FMC Corporation: *See*—
Formoso, Joaquin F., 310,342, Cl. D12-14.000.

Fong, Wa N., to DesignTime Company Limited. Watch. 310,333, 9-4-90, Cl. D10-32.000.

Ford Motor Company: *See*—
Kolenda, David F.; and Kane, Thomas J., 310,369, Cl. D14-258.000.
Repasky, Carol M.; and Dobies, Mark A., 310,370, Cl. D14-258.000.
Scott, Robert P.; and Bloom, Kenneth H., 310,371, Cl. D14-258.000.

Formoso, Joaquin F., to FMC Corporation. Tow tractor. 310,342, 9-4-90, Cl. D12-14.000.

Fratelli Guzzini S.p.A.: *See*—
Rossari, Ambrogio, 310,316, Cl. D7-590.000.

Freidrich Air Conditioning & Refrigeration Co.: *See*—
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,410, Cl. D23-354.000.

Friedrich Air Conditioning & Refrigeration Co.: *See*—
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,411, Cl. D23-354.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 310,348, Cl. D13-114.000.
Ishii, Keisuke; Taguchi, Hitoshi; and Sumi, Kiyohide, 310,373, Cl. D15-1.000.
Fukumoto, Toru; and Yamazaki, Shusuke, to Kabushiki Kaisha Toshiba. Dehumidifier. 310,412, 9-4-90, Cl. D23-359.000.
Fukushima, Hiroyuki, to Canon Kabushiki Kaisha. Camera case. 310,298, 9-4-90, Cl. D3-33.000.
Gerardiello, Paul. Pivotal safety razor. 310,428, 9-4-90, Cl. D28-48.000.
Gerber Products Company: *See*—
Herritz, Donald W., 310,417, Cl. D24-48.000.
Gerst, Christine C.: *See*—
Woods, Victoria, 310,401, Cl. D21-174.000.
Gierke, Martin P.; and Straub, Robert P., to Black & Decker Inc. Combined portable power vacuum and blower. 310,437, 9-4-90, Cl. D32-15.000.
Glover, Broc. Gasoline pump nozzle handle holder. 310,321, 9-4-90, Cl. D8-354.000.
Gold Star Co., Ltd.: *See*—
Kim, Tae B., 310,361, Cl. D14-126.000.
Shim, Kue S., 310,363, Cl. D14-129.000.
Greystone, Steven E.: *See*—
Brefka, Paul E.; Adriaansen, David L.; and Greystone, Steven E., 310,357, Cl. D14-113.000.
Grienke, Janice M.: *See*—
Woods, Victoria, 310,401, Cl. D21-174.000.
Grimes, Merlin D. Game board. 310,392, 9-4-90, Cl. D21-24.000.
Guilbeaux, Arthur, Jr. Toy gun. 310,400, 9-4-90, Cl. D21-148.000.
Gullet, Edwin G.: *See*—
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,410, Cl. D23-354.000.
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,411, Cl. D23-354.000.
H.M. Electronics, Inc.: *See*—
Derhaag, Robert L.; and Kutz, Donald A., 310,368, Cl. D14-228.000.
Haas Publishing Companies, Inc.: *See*—
Scardino, Tom K., 310,387, Cl. D20-6.000.
Hengesbach, Robert W. Combined reversible sprinkler nozzle and support ring. 310,404, 9-4-90, Cl. D23-213.000.
Herritz, Donald W., to Gerber Products Company. Disposable nurser bottle holder. 310,417, 9-4-90, Cl. D24-48.000.
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, to Fuji Jukogyo Kabushiki Kaisha. Engine generator. 310,348, 9-4-90, Cl. D13-114.000.
Hillman, Kevin P.; and Butcher, Ian, to Thomas J. Lipton, Inc. Combined frozen confection and container. 310,285, 9-4-90, Cl. D1-102.000.
Hollinger, David N., Jr.: *See*—
Brickner, Louis C.; McKee, Michael P.; Wilson, Raymond L.; and Hollinger, David N., Jr., 310,375, Cl. D15-133.000.
Horie, Hideyuki; Tabuchi, Masahiko; and Sugano, Yoshihiko, to Kabushiki Kaisha Toshiba. Combined word processor and computer. 310,350, 9-4-90, Cl. D14-100.000.
Howitt, George L., to Charles Beseler Company. Partition for a camera bag. 310,297, 9-4-90, Cl. D3-33.000.
Iacovelli, Marc R., to Rally Manufacturing Inc. Automobile fender spoiler guard. 310,345, 9-4-90, Cl. D12-185.000.
Iacovelli, Marc R., to Rally Accessories Inc. Twin beam quartz-halogen off road automobile headlight. 310,423, 9-4-90, Cl. D26-35.000.
Insul-Mark, Midwest, Inc.: *See*—
Bernacchi, Peter J.; and Barrett, Larry G., 310,324, Cl. D8-399.000.
Interlego A.G.: *See*—
Dideriksen, Erling T., 310,399, Cl. D21-141.000.
Inukai, Yoshinori, to Canon Kabushiki Kaisha. Image display terminal. 310,359, 9-4-90, Cl. D14-113.000.
Irish, Jeffry M.: *See*—
Tofte, S. David; and Irish, Jeffry M., 310,339, Cl. D10-46.000.
Ishii, Keisuke; Taguchi, Hitoshi; and Sumi, Kiyohide, to Fuji Jukogyo Kabushiki Kaisha. Engine. 310,373, 9-4-90, Cl. D15-1.000.
Ito, Hitomi, to Canon Kabushiki Kaisha. Camera case. 310,299, 9-4-90, Cl. D3-33.000.
Itoh, Yukinori: *See*—
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 310,348, Cl. D13-114.000.
Jackson Products, Inc.: *See*—
Boochard, E. L., 310,432, Cl. D29-9.000.
Jacuzzi Whirlpool Bath: *See*—
D'Innocente, Ralph; and Pauls, James R., 310,415, Cl. D24-38.000.
Jahan, Shapour, to Sater S.A. Wristwatch. 310,334, 9-4-90, Cl. D10-32.000.
Janus, Ronald E., to JI-SCO-NI Enterprises, Inc. Portable drink container. 310,296, 9-4-90, Cl. D3-301.000.
JI-SCO-NI Enterprises, Inc.: *See*—
Janus, Ronald E., 310,296, Cl. D3-301.000.
Johnsen, Anders. Rail for guiding and carrying a saw tool or the like. 310,376, 9-4-90, Cl. D15-140.000.
Jones, Owen T.: *See*—
Wyatt, Tristram D.; and Jones, Owen T., 310,402, Cl. D22-122.000.
Justen International (H.K.) Co.: *See*—
Wong, Pik L., 310,332, Cl. D10-32.000.
Kabushiki Kaisha Fuji Iryoki: *See*—
Yamasaki, Yoshikiyo, 310,416, Cl. D24-40.000.
Kabushiki Kaisha Toshiba: *See*—
Fukumoto, Toru; and Yamazaki, Shusuke, 310,412, Cl. D23-359.000.
Horie, Hideyuki; Tabuchi, Masahiko; and Sugano, Yoshihiko, 310,350, Cl. D14-100.000.
Sugano, Yoshihiko; and Tabuchi, Masahiko, 310,353, Cl. D14-106.000.
Kane, Thomas J.: *See*—
Kolenda, David F.; and Kane, Thomas J., 310,369, Cl. D14-258.000.
Kanno, Takuma: *See*—
Omino, Seiichi; and Kanno, Takuma, 310,383, Cl. D18-1.000.
Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, to NCR Corporation. Combined data input/output terminal and card reader. 310,352, 9-4-90, Cl. D14-105.000.
Katoh, Kazue: *See*—
Matuso, Toshiyuki; and Katoh, Kazue, 310,364, Cl. D14-163.000.
Kim, Tae B., to Gold Star Co., Ltd. Television receiver. 310,361, 9-4-90, Cl. D14-126.000.
Kimbrough, Mark S.; and Potter, Craig S., to Marpac Corporation. Portable environmental sound machine. 310,372, 9-4-90, Cl. D14-299.000.
Kitagawa, Ryunosuke, to Sharp Corporation. Television set. 310,360, 9-4-90, Cl. D14-126.000.
Kiyokane, Jerrilyn C., to Namkung Promotions, Inc. Spring clip. 310,323, 9-4-90, Cl. D8-395.000.
Klok, Jan, to U.S. Philips Corporation. Electric iron. 310,439, 9-4-90, Cl. D32-70.000.
Kobayashi, Masahiko: *See*—
Akaike, Kazuo; Kobayashi, Masahiko; Utsunomiya, Osamu; Takahashi, Ryuichi; and Takayasu, Tetsufumi, 310,366, Cl. D14-138.000.
Kobayashi, Toyohiro: *See*—
Wada, Seiji; Otsuka, Nobuo; Kobayashi, Toyohiro; and Thompson, Peter, 310,340, Cl. D10-50.000.
Kokusai Electric Co., Ltd.: *See*—
Akaike, Kazuo; Kobayashi, Masahiko; Utsunomiya, Osamu; Takahashi, Ryuichi; and Takayasu, Tetsufumi, 310,366, Cl. D14-138.000.
Kolenda, David F.; and Kane, Thomas J., to Ford Motor Company. Front panel for a graphic equalizer or similar article. 310,369, 9-4-90, Cl. D14-258.000.
Krauth, Rodney A. Combined pet waste container and cover therefor. 310,436, 9-4-90, Cl. D30-161.000.
Kushitani, Hisashi. Coverall for motorcyclists or the like. 310,286, 9-4-90, Cl. D2-29.000.
Kutz, Donald A.: *See*—
Derhaag, Robert L.; and Kutz, Donald A., 310,368, Cl. D14-228.000.
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., to Freidrich Air Conditioning & Refrigeration Co. Room air conditioner grill. 310,410, 9-4-90, Cl. D23-354.000.
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., to Friedrich Air Conditioning & Refrigeration Co. Room air conditioner grill. 310,411, 9-4-90, Cl. D23-354.000.
Larsch, Rebecca L. Nursing garment. 310,288, 9-4-90, Cl. D2-211.000.
Laughner Brothers, Inc.: *See*—
Beaman, Robert E.; and Clark, Willis F., 310,420, Cl. D25-22.000.
Leason, Hayden: *See*—
Nauseda, Lavergne; and Leason, Hayden, 310,421, Cl. D25-113.000.
Leblanc, France, to College Marie-Victorin. Game board. 310,391, 9-4-90, Cl. D21-17.000.
Lewis, E. Leonard: *See*—
Broderick, James M.; and Lewis, E. Leonard, 310,317, Cl. D7-700.000.
Lifeline Limited: *See*—
Bellm, Howard G., 310,431, Cl. D29-8.000.
Lutron Electronics Co., Inc.: *See*—
Rowen, Michael J., 310,349, Cl. D13-168.000.
Maas, Margaret A.: *See*—
Barron, Peter B.; Weaver, Allan; and Maas, Margaret A., 310,356, Cl. D14-113.000.
MacDonald, Sumner B. Key holder. 310,306, 9-4-90, Cl. D3-61.000.
Maloney, William J., II, to Quaker Oats Company, The. Combined toy house and garage. 310,395, 9-4-90, Cl. D21-114.000.
Margaret Aston AG: *See*—
Schmidt, Peter, 310,329, Cl. D9-409.000.
Marks, Robert J.; and Eaken, William L., to California Optical Leather, Inc. Reinforcing insert for a spectacle case. 310,300, 9-4-90, Cl. D3-34.000.
Marpac Corporation: *See*—
Kimbrough, Mark S.; and Potter, Craig S., 310,372, Cl. D14-299.000.
Martinez, Larry J. Shoe carousel. 310,310, 9-4-90, Cl. D6-457.000.
Masters, John L. Ice fishing instrument. 310,403, 9-4-90, Cl. D22-134.000.
Matuso, Toshiyuki; and Katoh, Kazue, to Sony Corporation. Combined cassette tape recorder and radio receiver. 310,364, 9-4-90, Cl. D14-163.000.
McElhaney, Craig J., to Quaker Oats Company, The. Toy school house. 310,396, 9-4-90, Cl. D21-114.000.
McKee, Michael P.: *See*—
Brickner, Louis C.; McKee, Michael P.; Wilson, Raymond L.; and Hollinger, David N., Jr., 310,375, Cl. D15-133.000.

Michels, Catherine L.; and Watson, Stephen A., to Visa International Service Association. Transaction card. 310,386, 9-4-90, Cl. D19-10.000.

Micro-Trak Systems, Inc.: *See—*
Tofte, S. David; and Irish, Jeffry M., 310,339, Cl. D10-46.000.

Miles Inc.: *See—*
Bigler, William E.; Cherepak, Michael S.; Collister, Kenneth D.; and Postma, Cynthia S., 310,413, Cl. D24-17.000.

Mito, Yoshio, to Toyotomi Kogyo Co., Ltd. Oil fired space heater. 310,408, 9-4-90, Cl. D23-348.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Wada, Seiji; Otsuka, Nobuo; Kobayashi, Toyohiro; and Thompson, Peter, 310,340, Cl. D10-50.000.

Moglia, Luciano, to Viset S.p.A. Container. 310,325, 9-4-90, Cl. D9-336.000.

Moglianesi, Carlos J.; Falco, Mark; and Peoples, Leslie, to Contour, Inc. Toothbrush. 310,307, 9-4-90, Cl. D4-104.000.

Moriconi, David P.; and Austin, Andrew G., to Tandon Corporation. Hard disk drive module. 310,354, 9-4-90, Cl. D14-109.000.

Morvant, Artie J. Permanent photographic memorial marker. 310,419, 9-4-90, Cl. D99-17.000.

Mueller, Hans W.; and Vought, Kenneth D., to Smith Coronoa Corporation. Ribbon cassette. 310,384, 9-4-90, Cl. D18-12.000.

Myers, Paul E. Toy automobile. 310,397, 9-4-90, Cl. D21-128.000.

Nakamura, Yasushi: *See—*
Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, 310,352, Cl. D14-105.000.

Namkung Promotions, Inc.: *See—*
Kiyokane, Jerrilyn C., 310,323, Cl. D8-395.000.

Nauseda, Lavergne; and Leason, Hayden, to Filtertek, Inc. Flat brick border section. 310,421, 9-4-90, Cl. D25-113.000.

NCR Corporation: *See—*
Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, 310,352, Cl. D14-105.000.

Nickles, Daniel R.: *See—*
Westimayer, David A.; Crookes, William E.; and Nickles, Daniel R., 310,374, Cl. D15-15.000.

Nitta, Tomio, to Tokai Corporation. Cigarette lighter. 310,427, 9-4-90, Cl. D27-154.000.

Nordenskjold, Kjell: *See—*
Eriksson, Gunder W.; and Nordenskjold, Kjell, 310,365, Cl. D14-138.000.

North American Philips Corp.: *See—*
Davis, Matthew, 310,362, Cl. D14-126.000.

Nuttall, Michael J.; and Au, Nelson S., to Bell & Howell Publication Systems Company. Combined monitor and process or for computer work station or similar article. 310,358, 9-4-90, Cl. D14-113.000.

Ohtsu Tire & Rubber Co., Ltd., The: *See—*
Shinomiya, Masami, 310,344, Cl. D12-148.000.

Oleg Cassini, Inc.: *See—*
Cassini, Oleg L., 310,330, Cl. D9-410.000.

Omino, Seiichi; and Kanno, Takuma, to Canon Kabushiki Kaisha. Electronic typewriter. 310,383, 9-4-90, Cl. D18-1.000.

Otake, Yasuo: *See—*
Higuchi, Masaaki; Atsuumi, Masaru; Otake, Yasuo; and Itoh, Yukinori, 310,348, Cl. D13-114.000.

Otsuka, Nobuo: *See—*
Wada, Seiji; Otsuka, Nobuo; Kobayashi, Toyohiro; and Thompson, Peter, 310,340, Cl. D10-50.000.

Pabros, Donald V.: *See—*
Wong, Richard G.; and Pabros, Donald V., 310,312, Cl. D6-596.000.

Pauls, James R.: *See—*
D'Innocente, Ralph; and Pauls, James R., 310,415, Cl. D24-38.000.

Pellegrino, Joseph P., to Prince Company, Inc., The. Fettucini. 310,287, 9-4-90, Cl. D1-126.000.

Peoples, Leslie: *See—*
Moglianesi, Carlos J.; Falco, Mark; and Peoples, Leslie, 310,307, Cl. D4-104.000.

Peterson, William R., to Tretorn AB. Golf shoe bottom. 310,294, 9-4-90, Cl. D2-317.000.

Philip Morris Incorporated: *See—*
Prendergast, William, 310,309, Cl. D6-455.000.

Postma, Cynthia S.: *See—*
Bigler, William E.; Cherepak, Michael S.; Collister, Kenneth D.; and Postma, Cynthia S., 310,413, Cl. D24-17.000.

Potter, Craig S.: *See—*
Kimbrough, Mark S.; and Potter, Craig S., 310,372, Cl. D14-299.000.

Powell, Joseph A., to Rainbow Fabrications, Incorporated. Support for a frame of an outdoor play device or the like. 310,322, 9-4-90, Cl. D8-382.000.

Prendergast, William, to Philip Morris Incorporated. Header for a merchandising display stand or the like. 310,309, 9-4-90, Cl. D6-455.000.

Prince Company, Inc., The: *See—*
Pellegrino, Joseph P., 310,287, Cl. D1-126.000.

Proctor, Rudy R.; and Reinstein, Fred M., to Turbo Tek Enterprises, Inc. Combined hose-attached telescoping pressure sprayer and connector for attachment to an additive fluid dispenser. 310,405, 9-4-90, Cl. D23-226.000.

Quaker Oats Company, The: *See—*
Maloney, William J., II, 310,395, Cl. D21-114.000.
McElhaney, Craig J., 310,396, Cl. D21-114.000.
Roy, David C.; and Roy, Marjorie E. C., 310,394, Cl. D21-59.000.

Rainbow Fabrications, Incorporated: *See—*
Powell, Joseph A., 310,322, Cl. D8-382.000.

Rally Accessories Inc.: *See—*
Iacovelli, Marc R., 310,423, Cl. D26-35.000.

Rally Manufacturing Inc.: *See—*
Iacovelli, Marc R., 310,345, Cl. D12-185.000.

Ratajski, Michel P., to Severin Montres AG. Combined watch and band. 310,331, 9-4-90, Cl. D10-32.000.

Ratajski, Michel P., to Severin Montres AG. Wrist watch and band. 310,337, 9-4-90, Cl. D10-39.000.

Reebok International Ltd.: *See—*
Boucher, Pamela B.; and Brown, Paul D., 310,295, Cl. D2-320.000.
Ringel, Judith, 310,290, Cl. D2-314.000.
Serna, Ralph; and Brown, Paul D., 310,293, Cl. D2-314.000.

Reinstein, Fred M.: *See—*
Proctor, Rudy R.; and Reinstein, Fred M., 310,405, Cl. D23-226.000.

Repasky, Carol M.; and Dobies, Mark A., to Ford Motor Company. Front panel for a compact disc player. 310,370, 9-4-90, Cl. D14-258.000.

Ringel, Judith, to Reebok International Ltd. Shoe upper. 310,290, 9-4-90, Cl. D2-314.000.

Rinke, Richard A. Pop can storage device. 310,327, 9-4-90, Cl. D9-341.000.

Rogers Manufacturing Company, The: *See—*
Bitel, Vincent J., 310,315, Cl. D7-554.000.

Rook, Earl T. Tripod lantern support. 310,426, 9-4-90, Cl. D26-138.000.

Rossari, Ambrogio, to Fratelli Guzzini S.p.A. Condiment set. 310,316, 9-4-90, Cl. D7-590.000.

Rowen, Michael J., to Lutron Electronics Co., Inc. Wireless transmitter for selectable light level control switch. 310,349, 9-4-90, Cl. D13-168.000.

Roy, David C.; and Roy, Marjorie E. C., to Quaker Oats Company, The. Stacking toy. 310,394, 9-4-90, Cl. D21-59.000.

Roy, Marjorie E. C.: *See—*
Roy, David C.; and Roy, Marjorie E. C., 310,394, Cl. D21-59.000.

Rule, Geoffrey: *See—*
Allen, Keith R.; Crawford, Jeffrey; and Rule, Geoffrey, 310,409, Cl. D23-351.000.

Russell, John P. Eyeshield. 310,378, 9-4-90, Cl. D16-107.000.

Russell, John P. Eyeshield. 310,379, 9-4-90, Cl. D17-107.000.

Rutherford, Barry: *See—*
Crawford, Dennis; and Rutherford, Barry, 310,388, Cl. D20-10.000.

Ryobi Motor Products Corp.: *See—*
Burns, Stephen R., 310,438, Cl. D32-22.000.

Sandvik Aktiebolag: *See—*
Backman, Sture, 310,318, Cl. D8-95.000.

Sanrio Company, Ltd.: *See—*
Tsuji, Shintaro, 310,341, Cl. D10-71.000.

Sater S.A.: *See—*
Jahan, Shapour, 310,334, Cl. D10-32.000.

Scardino, Tom K., to Haas Publishing Companies, Inc. Publication vending machine. 310,387, 9-4-90, Cl. D20-6.000.

Schmidt, Peter, to Margaret Aston AG. Bottle with cap. 310,329, 9-4-90, Cl. D9-409.000.

Scognamillo, Frank; and Covington, Jay C. Key ring. 310,305, 9-4-90, Cl. D3-61.000.

Scott, Robert P.; and Bloom, Kenneth H., to Ford Motor Company. Front control panel for a combined vehicular cassette player and radio receiver. 310,371, 9-4-90, Cl. D14-258.000.

Selbiger, Lawrence, to Avia Group International, Inc. Shoe upper. 310,291, 9-4-90, Cl. D2-314.000.

Selbiger, Lawrence, to Avia Group International, Inc. Shoe upper. 310,292, 9-4-90, Cl. D2-314.000.

Serna, Ralph; and Brown, Paul D., to Reebok International Ltd. Shoe upper. 310,293, 9-4-90, Cl. D2-314.000.

Severin Montres AG: *See—*
Ratajski, Michel P., 310,331, Cl. D10-32.000.
Ratajski, Michel P., 310,337, Cl. D10-39.000.
Wunderman, Severin S., 310,335, Cl. D10-32.000.
Wunderman, Severin S., 310,336, Cl. D10-32.000.

Sharp Corporation: *See—*
Kitagawa, Ryunosuke, 310,360, Cl. D14-126.000.

Sharrah, Raymond L., to Streamlight, Inc. Flashlight. 310,425, 9-4-90, Cl. D26-49.000.

Shih, Hsiu-Chen, to Benz Electronic Co., Ltd. Electric shaver. 310,430, 9-4-90, Cl. D28-49.000.

Shim, Kue S., to Gold Star Co., Ltd. Combined television and video recorder. 310,363, 9-4-90, Cl. D14-129.000.

Shinomiya, Masami, to Ohtsu Tire & Rubber Co., Ltd., The. Vehicle tire. 310,344, 9-4-90, Cl. D12-148.000.

Shupe, John D. Light bulb. 310,422, 9-4-90, Cl. D26-4.000.

Sigma Air Conditioning Pty, Limited: *See—*
Allen, Keith R.; Crawford, Jeffrey; and Rule, Geoffrey, 310,409, Cl. D23-351.000.

Smith Coronoa Corporation: *See—*
Mueller, Hans W.; and Vought, Kenneth D., 310,384, Cl. D18-12.000.

Sony Corporation: *See—*
Matuso, Toshiyuki; and Katoh, Kazue, 310,364, Cl. D14-163.000.

Southard, Robert C. Gun support cradle. 310,302, 9-4-90, Cl. D3-38.000.

Spencer, Paul. License plate frame. 310,347, 9-4-90, Cl. D12-193.000.

Stairs, Henry M., Jr., to American Standard Inc. Water closet or the like. 310,407, 9-4-90, Cl. D23-301.000.

Straub, Robert P.: *See*—
Gierke, Martin P.; and Straub, Robert P., 310,437, Cl. D32-15.000.
Streamlight, Inc.: *See*—
Sharrah, Raymond L., 310,425, Cl. D26-49.000.
Sugano, Yoshihiko; and Tabuchi, Masahiko, to Kabushiki Kaisha Toshiba. Electronic computer. 310,353, 9-4-90, Cl. D14-106.000.
Sugano, Yoshihiko: *See*—
Horie, Hideyuki; Tabuchi, Masahiko; and Sugano, Yoshihiko, 310,350, Cl. D14-100.000.
Sumi, Kiyohide: *See*—
Ishii, Keisuke; Taguchi, Hitoshi; and Sumi, Kiyohide, 310,373, Cl. D15-1.000.
Tabuchi, Masahiko: *See*—
Horie, Hideyuki; Tabuchi, Masahiko; and Sugano, Yoshihiko, 310,350, Cl. D14-100.000.
Sugano, Yoshihiko; and Tabuchi, Masahiko, 310,353, Cl. D14-106.000.
Taguchi, Hitoshi: *See*—
Ishii, Keisuke; Taguchi, Hitoshi; and Sumi, Kiyohide, 310,373, Cl. D15-1.000.
Takahashi, Ryuichi: *See*—
Akaike, Kazuo; Kobayashi, Masahiko; Utsunomiya, Osamu; Takahashi, Ryuichi; and Takayasu, Tetsufumi, 310,366, Cl. D14-138.000.
Takayasu, Tetsufumi: *See*—
Akaike, Kazuo; Kobayashi, Masahiko; Utsunomiya, Osamu; Takahashi, Ryuichi; and Takayasu, Tetsufumi, 310,366, Cl. D14-138.000.
Takeda, Junnosuke: *See*—
Kato, Shuzo; Nakamura, Yasushi; and Takeda, Junnosuke, 310,352, Cl. D14-105.000.
Tandon Corporation: *See*—
Moriconi, David P.; and Austin, Andrew G., 310,354, Cl. D14-109.000.
Telefonaktiebolaget LM Ericsson: *See*—
Eriksson, Gunder W.; and Nordenskjold, Kjell, 310,365, Cl. D14-138.000.
Thieser, Gerhard, to Borden France S.A. Toy boat. 310,398, 9-4-90, Cl. D21-130.000.
Thomas J. Lipton, Inc.: *See*—
Hillman, Kevin P.; and Butcher, Ian, 310,285, Cl. D1-102.000.
Thompson, Peter: *See*—
Wada, Seiji; Otsuka, Nobuo; Kobayashi, Toyohiro; and Thompson, Peter, 310,340, Cl. D10-50.000.
Thomson, Art. Envelope. 310,385, 9-4-90, Cl. D19-3.000.
Tofte, S. David; and Irish, Jeffry M., to Micro-Trak Systems, Inc. Point location device. 310,339, 9-4-90, Cl. D10-46.000.
Tokai Corporation: *See*—
Nitta, Tomio, 310,427, Cl. D27-154.000.
Toyogo, Inc.: *See*—
Besasie, Joseph C., 310,390, Cl. D21-13.000.
Toyotomi Kogyo Co., Ltd.: *See*—
Mito, Yoshio, 310,408, Cl. D23-348.000.
Trager, Dennis. Hard disk drive for mounting on the rear of a computer. 310,355, 9-4-90, Cl. D14-109.000.
Tretorn AB: *See*—
Peterson, William R., 310,294, Cl. D2-317.000.
Trewarn, Neville R. Sign. 310,389, 9-4-90, Cl. D20-41.000.
Tribolet, Leslie L. Baby bottle holder. 310,418, 9-4-90, Cl. D24-48.000.
Tsuji, Shintaro, to Sanrio Company, Ltd. Tape measure. 310,341, 9-4-90, Cl. D10-71.000.
Turbo Tek Enterprises, Inc.: *See*—
Proctor, Rudy R.; and Reinstein, Fred M., 310,405, Cl. D23-226.000.
U.S. Philips Corporation: *See*—
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Klok, Jan, 310,439, Cl. D32-70.000.
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Virgo Industries, Inc.: *See*—
Cleveland, Floyd M., 310,435, Cl. D30-152.000.
Visa International Service Association: *See*—
Michels, Catherine L.; and Watson, Stephen A., 310,386, Cl. D19-10.000.
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Vought, Kenneth D.: *See*—
Mueller, Hans W.; and Vought, Kenneth D., 310,384, Cl. D18-12.000.
Wada, Seiji; Otsuka, Nobuo; Kobayashi, Toyohiro; and Thompson, Peter, to Mitsubishi Denki Kabushiki Kaisha. Local room thermostat. 310,340, 9-4-90, Cl. D10-50.000.
Wang-Lee, Min Y. Bifocal lens or similar article. 310,377, 9-4-90, Cl. D16-101.000.
Watson, James B.: *See*—
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,410, Cl. D23-354.000.
Lapychak, David M.; Alsup, James D., Jr.; Watson, James B.; and Gullet, Edwin G., 310,411, Cl. D23-354.000.
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Weaver, Allan: *See*—
Barron, Peter B.; Weaver, Allan; and Maas, Margaret A., 310,356, Cl. D14-113.000.
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Wilson, Raymond L.: *See*—
Brickner, Louis C.; McKee, Michael P.; Wilson, Raymond L.; and Hollinger, David N., Jr., 310,375, Cl. D15-133.000.
Wingate, Barry; and Esslinger, Hartmut H., to Eastman Kodak Company. Still camera. 310,382, 9-4-90, Cl. D16-209.000.
Wolsey, Paul. Combined toothbrush and pen. 310,308, 9-4-90, Cl. D4-108.000.
Wong, Pik L., to Justen International (H.K.) Co. Combined watch and strap. 310,332, 9-4-90, Cl. D10-32.000.
Wong, Richard G.; and Pabros, Donald V. Back support cushion. 310,312, 9-4-90, Cl. D6-596.000.
Woods, Victoria, to Woods, Victoria; Gerst, Christine C.; and Grienke, Janice M. Doll. 310,401, 9-4-90, Cl. D21-174.000.
Wunderman, Severin S., to Severin Montres AG. Combined wristwatch and bracelet. 310,335, 9-4-90, Cl. D10-32.000.
Wunderman, Severin S., to Severin Montres AG. Combined wristwatch and bracelet. 310,336, 9-4-90, Cl. D10-32.000.
Wyatt, Tristram D.; and Jones, Owen T., to University College Cardiff Consultants Limited; and Biological Control Systems Ltd. Insect trap. 310,402, 9-4-90, Cl. D22-122.000.
Yamasaki, Yoshikiyo, to Kabushiki Kaisha Fuji Iryoki. Portable massager. 310,416, 9-4-90, Cl. D24-40.000.
Yamazaki, Shusuke: *See*—
Fukumoto, Toru; and Yamazaki, Shusuke, 310,412, Cl. D23-359.000.
Zierke, Michael L. Floatation knee pad. 310,433, 9-4-90, Cl. D29-10.000.

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Conard-Pyle Company, The: *See*—
Meilland, Alain A., 7,313, Cl. 24.000.

Dickson, Patrick, to Jackson & Perkins Company. Rose plant Dicmadder. 7,312, 9-4-90, Cl. 1.000.

Drewlow, Lyndon W., to Mikkelsens, Inc. Poinsettia plant named Yuletide. 7,316, 9-4-90, Cl. 86.000.

Frazer, Edwin J., to Hartman Plant Laboratories, Inc. Dieffenbachia plant named Golden Sunset. 7,317, 9-4-90, Cl. 88.000.

Hartman Plant Laboratories, Inc.: *See*—
Frazer, Edwin J., 7,317, Cl. 88.000.

Ison, William G. Darlene. 7,314, 9-4-90, Cl. 47.000.

Jackson & Perkins Company: *See*—
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Meilland, Alain A., to Conard-Pyle Company, The. Rose plant—Meigrelou variety. 7,313, 9-4-90, Cl. 24.000.

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Drewlow, Lyndon W., 7,316, Cl. 86.000.

Segers, Th A., to Twyford Plant Laboratories, Inc. Gerbera plant named 'Diva'. 7,318, 9-4-90, Cl. 68.000.

Twyford Plant Laboratories, Inc.: *See*—
Segers, Th A., 7,318, Cl. 68.000.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named Leona. 7,315, 9-4-90, Cl. 74.000.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 7,315, Cl. 74.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 4TH DAY OF SEPTEMBER, 1990

Agarwal, Pawan K.: *See*—
Wagensommer, Joseph; Agarwal, Pawan K.; and Duvdevani, Ilan, H818, Cl. 525-333.900.

Arismendi, Andy M., Jr.: *See*—
Willis, Carl L.; and Arismendi, Andy M., Jr., H815, Cl. 252-49.600.

Barr, Dallas N.: *See*—
Nettleton, John E.; and Barr, Dallas N., H822, Cl. 330-4.300.

Carder, James H.; Le, Anh H.; and Dacres, Chester M., to United States of America, Navy. Stibine filter and antimonial lead acid batteries. H816, 9-4-90, Cl. 429-86.000.

Dacres, Chester M.: *See*—
Carder, James H.; Le, Anh H.; and Dacres, Chester M., H816, Cl. 429-86.000.

Duvdevani, Ilan: *See*—
Wagensommer, Joseph; Agarwal, Pawan K.; and Duvdevani, Ilan, H818, Cl. 525-333.900.

Exxon Research & Engineering Co.: *See*—
Wagensommer, Joseph; Agarwal, Pawan K.; and Duvdevani, Ilan, H818, Cl. 525-333.900.

Fawwaz, Rashid A.: *See*—
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Ferrone, Soldano, H819, Cl. 530-389.000.

Ferrone, Soldano: *See*—
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Ferrone, Soldano, H819, Cl. 530-389.000.

Fuji Photo Film Co., Ltd.: *See*—
Toriuchi, Masaharu; and Koya, Keizo, H817, Cl. 430-544.000.

Halley, Lawrence C., Jr.: *See*—
Hatfield, Michael O.; and Halley, Lawrence C., Jr., H821, Cl. 324-627.000.

Hatfield, Michael O.; and Halley, Lawrence C., Jr., to United States of America, Navy. Means and method for performing shielding effectiveness measurements using mode-stirred chambers. H821, 9-4-90, Cl. 324-627.000.

Koya, Keizo: *See*—
Toriuchi, Masaharu; and Koya, Keizo, H817, Cl. 430-544.000.

Le, Anh H.: *See*—
Carder, James H.; Le, Anh H.; and Dacres, Chester M., H816, Cl. 429-86.000.

Nettleton, John E.; and Barr, Dallas N. Method of amplitude modulating a laser beam. H822, 9-4-90, Cl. 330-4.300.

Ragon, Robert E. Combined smoker/cooker unit. H813, 9-4-90, Cl. 99-467.000.

Sherrell, Dennis L., to United States of America, Energy. Collapsable seal member. H814, 9-4-90, Cl. 277-34.300.

Smoot, Wayne A. Infrared safety beacon. H820, 9-4-90, Cl. 250-504.00R.

Srivastava, Suresh C.; Fawwaz, Rashid A.; and Ferrone, Soldano, to United States of America, Energy. Palladium-109 labeled anti-melanoma monoclonal antibodies. H819, 9-4-90, Cl. 530-389.000.

Toriuchi, Masaharu; and Koya, Keizo, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. H817, 9-4-90, Cl. 430-544.000.

United States of America
Energy: *See*—
Sherrell, Dennis L., H814, Cl. 277-34.300.
Srivastava, Suresh C.; Fawwaz, Rashid A.; and Ferrone, Soldano, H819, Cl. 530-389.000.
Navy: *See*—
Carder, James H.; Le, Anh H.; and Dacres, Chester M., H816, Cl. 429-86.000.
Hatfield, Michael O.; and Halley, Lawrence C., Jr., H821, Cl. 324-627.000.

Wagensommer, Joseph; Agarwal, Pawan K.; and Duvdevani, Ilan, to Exxon Research & Engineering Co. Elastomeric compositions (C-1911). H818, 9-4-90, Cl. 525-333.900.

Willis, Carl L.; and Arismendi, Andy M., Jr. Lubricant composition containing a viscosity index improver having dispersant properties. H815, 9-4-90, Cl. 252-49.600.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 4, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

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59 4,953,664

CLASS 187

9 R 4,953,665
4,953,666

CLASS 188

31 4,953,667
158 4,953,668
171 4,953,669
181 A 4,953,670
299 4,953,671
378 4,953,672

CLASS 190

103 4,953,673
108 4,953,674

CLASS 192

0.096 4,953,679
3.3 4,953,677
8 C 4,953,676
8 R 4,953,675
67 R 4,953,678
111 B 4,953,680

CLASS 194

208 4,953,682
235 4,953,683
346 4,953,681

CLASS 198

311 4,953,684
328 4,953,685
332 4,953,686
347.1 4,953,687
434 4,953,688
497 4,953,689
690.2 4,953,690
803.01 4,953,691
834 4,953,692
853 4,953,693

CLASS 200

50 C 4,954,671
51.09 4,954,672
61.43 4,954,673
175 4,954,674
314 4,954,668
317 4,954,675
834 4,954,677

CLASS 202

176 4,954,222
180 4,953,694

CLASS 203

1 4,954,223
51 4,954,224

CLASS 204

11 4,954,225
15 4,954,226
72 4,954,227
105 R 4,954,228
130 4,954,229
149 4,954,230
157.6 4,954,231
192.23 4,954,232
197 4,954,172
4,954,233
212 4,954,234
273 4,954,235
299 R 4,954,236
4,954,237
430 4,954,238

CLASS 206

5 4,953,695
214 4,953,696
315.400 4,953,697
319 4,953,698
330 4,953,699
333 4,953,700
419 4,953,701
432 4,953,702
451 4,953,703
493 4,953,704
571 4,954,239
594 4,953,705
603 4,953,706
621.4 4,953,707
632 4,953,708

CLASS 208

50 4,954,240
59 4,954,241
79 Re.33,323
99 4,954,242
120 4,954,243
4,954,244
138 4,954,245
355 4,954,247
402 4,954,246

CLASS 209

44 4,953,709
127.1 4,954,248
273 4,954,249
518 4,953,710
535 4,953,711
629 4,954,250
669 4,953,712

CLASS 210

136 4,954,252
198.2 4,954,253
209 4,954,254
437 4,954,255
490 4,954,256
607 4,954,257
611 4,954,258
617 4,954,259
634 4,954,260
638 4,954,261
4,954,262
695 4,954,263
710 4,954,265
747 4,954,266
771 4,954,267
772 4,954,268
782 4,954,264
806 4,954,251

CLASS 211

13 4,953,713
36 4,953,714
37 4,953,715
107 4,953,716
113 4,953,717
123 4,953,718
188 4,953,719

CLASS 212

147 4,953,721
156 4,953,722
159 4,953,723
176 4,953,720
188 4,953,724

CLASS 213

1.3 4,953,726
8 4,953,727

CLASS 215

1 A 4,953,725
250 4,953,728
255 4,953,729

CLASS 217

4 4,953,730
56 4,953,731

CLASS 219

10.43 4,954,678
10.55 A 4,954,681
10.55 E 4,954,680
10.55 M 4,954,679
76.14 4,954,682
84 B1 4,780,589
110 4,954,686
119 4,954,687
121.5 4,954,683
4,954,688
125.1 4,954,689
137 PS 4,954,691
137.31 4,954,690
200 4,954,676
365 4,954,692
390 4,954,684
400 4,954,693
413 4,954,694
548 4,954,695
4,954,696

CLASS 220

3.4 4,953,733
4.02 4,953,734
6 4,953,735
20 4,953,736
93 4,953,739
253 Re.33,319
263 4,953,740
273 4,953,741
367 4,953,742
369 4,953,743
404 4,953,744
502 4,953,732
606 4,953,738

CLASS 221

5 4,953,745
35 4,953,746
45 4,953,747
59 4,953,748
168 4,953,749

CLASS 222

1 4,953,750
14 4,953,751
23 4,953,752
105 4,953,753
129.2 4,953,754
146.5 4,953,755
309 4,953,756
341 4,953,758
402.2 4,953,759
600 4,953,760
602 4,953,761
606 4,953,762
644 4,953,763

CLASS 224

151 4,953,764
4,953,765
181 4,953,766
192 4,953,767
205 4,953,768
247 4,953,769
250 4,953,770
273 4,953,771
282 4,953,772
310 4,953,757
328 4,953,773

CLASS 227

131 4,953,774

CLASS 228

107 4,953,775
119 4,953,776
4,953,777
173.6 4,953,778

CLASS 229

23 R 4,953,779
92.8 4,953,780
125.11 4,953,781
157 4,953,782

CLASS 232

35 4,953,783

CLASS 235

381 4,954,697
454 4,954,698
462 4,954,699

CLASS 236

44 A 4,953,784

CLASS 238

10 A 4,953,785
10 B 4,953,786
349 4,953,787

CLASS 239

107 4,953,788
132.5 4,953,789
154 4,953,790
333 4,953,791
654 4,953,792

CLASS 241

24 4,953,794
119 4,953,793
159 4,953,795
298 4,953,796

CLASS 242

7.11 4,953,797
35.5 R 4,953,798
35.6 E 4,953,799
45 4,953,800
46.2 4,953,802
47 4,953,803
4,953,804
58.6 4,953,805
72.1 4,953,806
76 4,953,807
78.6 4,953,808
107.300 4,953,809
129 4,953,810

CLASS 244

17.19 4,953,811
55 4,953,812
147 4,953,813

CLASS 246

382 4,953,814

CLASS 248

65 4,953,801
97 4,953,815
102 4,953,816
222.2 4,953,817
222.3 4,953,818
230 4,953,819
231.5 4,953,820
276 4,953,821
281.1 4,953,822
346.1 4,953,823

CLASS 250

70 4,953,737
201.2 4,954,702
201.8 4,954,701
201.9 4,954,700
208.1 4,954,703
307 4,954,704
310 4,954,705
327.2 4,954,706
337 4,954,707
352 4,954,708
385.1 4,954,709
4,954,710
423 R 4,954,711
440.1 4,954,712
458.1 4,954,713
4,954,714
461.1 4,954,715
482.1 4,954,716
492.3 4,954,717
493.1 4,954,718
560 4,954,719
561 4,954,720
4,954,721
571 4,954,722
572 4,954,723
577 4,954,724

CLASS 251

8 4,953,824
129.17 4,953,825
331 4,953,826

CLASS 252

8 4,954,271
8.8 4,954,270
25 4,954,272
39 4,954,273
45 4,954,274
48.6 4,954,275
49.6 4,954,276
4,954,277
70 4,954,278
4,954,279
86 4,954,269
90 4,954,280
99 B1 4,539,131
107 4,954,281
117 4,954,282
135 4,954,283
170 4,954,284
174.11 4,954,285
174.22 4,954,286
182.26 4,954,287
299.01 4,954,288
305 4,954,289
4,954,290
315.1 4,954,291
542 4,954,292
625 4,954,293

CLASS 254

134.4 4,953,827
4,953,828
333 4,953,829

CLASS 256

65 4,953,830

CLASS 261

16 4,954,295
102 4,953,831
114.1 4,954,294
122 4,954,296

CLASS 264

1.3 4,954,297
4.6 4,954,298
22 4,954,299
36 4,954,300
40.1 4,954,301
4,954,302
101 4,954,303
137 4,954,304
157 4,954,305
210.2 4,954,306
272.15 4,954,307
272.17 4,954,308
307 4,954,309
520 4,954,310

CLASS 266

82 4,953,832

CLASS 267

140.1 4,953,833
160 4,953,834
180 4,953,835

CLASS 269

17 4,953,836
43 4,953,837
45 4,953,838
73 4,953,839
282 4,953,840

CLASS 270

58 4,953,841

CLASS 271

2 4,953,842
3.1 4,953,843
9 4,953,844
217 4,953,845
251 4,953,846
277 4,953,847

CLASS 272

8.5 4,953,848
35 4,953,849
70.3 4,953,851
73 4,953,850
78 4,953,852
93 4,953,854
97 4,953,853
118 4,953,855
119 4,953,856
123 4,953,857
146 4,953,858

CLASS 273

1 GA 4,953,859
23 4,953,860
73 J 4,953,861
75 4,953,862
113 4,953,863
161 4,953,864
176F 4,953,865
183 D 4,953,866
4,953,867
186 A 4,953,868
236 4,953,869
241 4,953,870
252 4,953,871
254 4,953,872
274 4,953,873
355 4,953,874
373 4,953,875

CLASS 277

165 4,953,876

CLASS 279

2 A 4,953,877

CLASS 280

30 4,953,878
47.19 4,953,879
47.38 4,953,880
91 4,953,881
258 4,953,882
293 4,953,893
477 4,953,883
609 4,953,884
610 4,953,885
640 4,953,886

647 4,953,887
654 4,953,888
661 4,953,889
707 4,953,890
788 4,953,891
814 4,953,892
846 4,953,894

CLASS 283

102 4,953,895

CLASS 285

23 4,953,580
197 4,953,896
226 4,953,897
340 4,953,898
420 4,953,899

CLASS 292

307 R 4,953,900
340 4,953,901

CLASS 294

1.1 4,953,902
4,953,903
15 4,953,904
19.1 4,953,905
19.2 4,953,906

CLASS 296

93 4,953,907
97.4 4,953,908
136 4,953,909
191 4,953,912
223 4,953,910

CLASS 297

195 4,953,911
459 4,953,913

CLASS 299

11 4,953,914
18 4,953,915
76 4,953,916

CLASS 303

115 4,953,918
961 4,953,917

CLASS 305

31 4,953,919
35 EB 4,953,920
4,953,921
35 R Re.33,324

CLASS 307

10.1 4,954,725
46 4,954,726
112 4,954,727
296.8 4,954,728
443 4,954,729
451 4,954,730
454 4,954,738
482 4,954,731
520 4,954,732

CLASS 310

71 4,954,733
4,954,734
82 4,954,735
156 4,954,739
168 4,954,737
185 4,954,740
316 4,954,741
4,954,742

CLASS 313

120 4,954,743
153 4,954,748
336 4,954,744
446 4,954,745
506 4,954,746
4,954,747

CLASS 315

39 4,954,756
97 4,954,749
111.81 4,954,750
4,954,751
169.3 4,954,752
219 4,954,753
4,954,754
248 4,954,755
403 4,954,757
411 4,954,758

CLASS 316

156 4,954,736

CLASS 318

375 4,954,759
480 4,954,760
568.1 4,954,761
568.19 4,954,762
605 4,954,763
798 4,954,764

CLASS 319

390 4,954,685

CLASS 323

217 4,954,765
272 4,954,766
283 4,954,767
300 4,954,768
313 4,954,769

CLASS 324

71.3 4,954,770
158 F 4,954,774
158 R 4,954,771
4,954,772
4,954,773
174 4,954,775
232 4,954,777
233 4,954,778
306 4,954,779
318 4,954,780
4,954,781
538 4,954,782
696 4,954,783
716 4,954,776

CLASS 328

155 4,954,784
167 4,954,785

CLASS 330

4.3 4,954,786
4,954,789
149 4,954,787
207 A B1 4,042,890

CLASS 331

16 4,954,788
169 4,954,792

CLASS 332

164 4,954,790
4,954,791

CLASS 333

133 4,954,793
182 4,954,794
194 4,954,795
206 4,954,796

CLASS 335

14 Re.33,325
161 4,954,798
236 4,954,799
284 4,954,800

CLASS 336

90 4,954,801

CLASS 337

380 4,954,802

CLASS 338

32 R 4,954,803
162 4,954,804

CLASS 340

384 E 4,954,805
442 4,954,806
459 4,954,807
475 4,954,808
516 4,954,809
545 4,954,810
550 4,954,811
551 4,954,812
571 4,954,813
572 4,954,814
686 4,954,815
693 4,954,816
706 4,954,817
721 4,954,818
4,954,819
825.52 4,954,821
825.69 4,954,820
925 4,954,822

CLASS 341

26 4,954,823
61 4,954,824
64 4,954,825
100 4,954,826
159 4,954,827
4,954,831

CLASS 342

20 4,954,828
60 4,954,829
137 4,954,830
352 4,954,832
357 4,954,833
360 4,954,834
418 4,954,835
450 4,954,836
458 4,954,837

CLASS 343

704 4,954,797

CLASS 346

76 PH 4,954,839
93 4,954,840
135.1 4,954,841
139 R 4,954,842

CLASS 350

1.7 4,953,922
3.61 4,953,923
3.64 4,953,924
6.1 4,953,925
6.8 4,953,926
4,953,927
96.11 4,953,930
96.12 4,953,931
4,953,943
96.15 4,953,932
4,953,933
4,953,934
96.16 4,953,935
96.17 4,953,936
96.18 4,953,937
4,953,938
96.19 4,953,939
96.2 4,953,929
96.20 4,953,940
4,953,941
96.21 4,953,944
96.23 4,953,942
4,953,945
4,953,946
96.33 4,953,947
128 4,953,948
130 4,953,949
174 4,953,950
320 4,953,951
333 Re.33,321
337 4,953,952
339 F 4,953,953
354 4,953,954
4,953,955
419 4,953,956
423 4,953,957
425 4,953,958
432 4,953,959
442 4,953,960
486 4,953,961
507 4,953,962
547 4,953,963
557 4,953,964
632 4,953,965

CLASS 351

41 4,953,966
136 4,953,967
211 4,953,968
221 4,953,969
223 4,953,970

CLASS 353

122 4,953,971

CLASS 354

75 4,954,857
145.1 4,954,858
173.11 4,954,859
246 4,954,860
320 4,954,838
403 4,954,861

CLASS 355

1 4,954,862
51 4,954,863
210 4,954,843
260 4,954,844
290 4,954,845
311 4,954,846
318 4,954,847
319 4,954,848
4,954,849

CLASS 356

4 4,953,972
32 4,953,973
128 4,953,974
246 4,953,975
301 4,953,976
312 4,953,977
336 4,953,978
338 4,953,979
4,953,980
353 4,953,981
357 4,953,982
445 4,953,983

CLASS 357

14 4,954,850
15 4,954,851
4,954,852
17 4,954,853
23.4 4,954,854
23.5 4,953,928
23.7 4,954,855
30 4,954,856
4,954,864
38 4,954,869
43 4,954,865
45 4,954,866
52 4,954,867
53 4,954,868
67 4,954,870
4,954,871
70 4,954,872
72 4,954,873
74 4,954,874
75 4,954,875
76 4,954,876
80 4,954,877
81 4,954,878

CLASS 358

13 4,954,879
17 4,954,880
22 4,954,881
4,954,882
4,954,883
29 4,954,884
31 4,954,885
75 4,954,887
4,954,888
80 4,954,889
86 4,954,886
88 4,954,890
101 4,954,891
133 4,954,892
148 4,954,893
167 4,954,894
183 4,954,898
191.1 4,954,899
213.11 4,954,895
213.26 4,954,900
228 4,954,897
234 4,954,896
242 4,954,901
296 4,954,910
323 4,954,911
448 4,954,912
474 4,954,913
475 4,954,914

CLASS 360

10.2 4,954,902
46 4,954,903
75 4,954,904
77.03 4,954,905
77.08 4,954,906
78.04 4,954,908
4,954,909
78.07 4,954,907
92 4,954,915
96.5 4,954,916
98.06 4,954,918
104 4,954,919
113 4,954,920
121 4,954,921

CLASS 361

42 4,954,922
98 4,954,917
111 4,954,923
187 4,954,924
283 4,954,925
304 4,954,926
328 4,954,927
391 4,954,928
414 4,954,929

CLASS 362

26 4,954,930
32 4,954,931
61 4,954,932
66 4,954,933
125 4,955,044
156 4,954,934
245 4,954,935
249 4,954,936
255 4,954,937
298 4,954,938
406 4,954,939

CLASS 363

146 4,954,940

CLASS 364

200 4,954,941
4,954,942
4,954,943
4,954,944
4,954,945
4,954,946
4,954,947
4,954,948
4,954,949
4,954,950
4,954,951
413.29 4,954,954
419 4,954,955
4,954,956
424.05 4,954,957
444 4,954,958
449 4,954,959
484 4,954,960
4,954,961
513 4,954,952
4,954,962
4,954,963
4,954,964
514 4,954,965
518 4,954,966
4,954,967
519 4,954,968
521 4,954,969
4,954,970
525 4,955,032
526 4,954,972
551.01 4,954,973
4,954,974
567 4,954,975
578 4,954,953
4,954,976
710.03 4,954,977
715.1 4,954,978
900 4,954,979
4,954,980
4,954,981
4,954,982
4,954,983
4,954,984

CLASS 365

108 4,954,985
177 4,954,989
185 4,954,990
189.01 4,954,986
4,954,991
189.02 4,954,987
4,954,988
207 4,954,992
226 4,954,993
230.06 4,954,994

CLASS 366

7 4,954,995
76 4,953,984
244 4,953,985

CLASS 367

13 4,954,996
4,954,997
82 4,954,998
97 4,954,999
99 4,955,002
117 4,955,000
118 4,955,001
125 4,955,003
137 4,955,004
139 4,955,005
154 4,955,012

CLASS 369

13 4,955,006
4,955,007
32 4,955,008
4,955,009
4,955,010
54 4,955,011

CLASS 370

1 4,955,013
3 4,955,014
56 4,955,015
60 4,955,016
4,955,017
85.1 4,955,018
85.7 4,955,019
85.9 4,955,020
124 4,955,021

CLASS 371

37.4 4,955,022
40.1 4,955,023
4,955,024
66 B1 4,763,333

CLASS 372

6 4,955,025
18 4,955,026
4,955,027
4,955,028
20 4,955,029
31 4,955,030
44 4,955,031
45 4,954,971
50 4,955,033
56 4,955,035
69 4,955,034
94 4,955,036
96

CLASS 374

136 4,953,986

CLASS 375

27 4,955,037
35 4,955,038
75 4,955,039
119 4,955,040

CLASS 376

258 4,954,311
260 4,954,312

CLASS 377

54 4,955,041

CLASS 378

39 4,955,042
108 4,955,043
122 4,955,045
197 4,955,046

CLASS 379

53 4,955,048
58 4,955,049
59 4,955,050
75 4,955,051
94 4,955,052
112 4,955,047
253 4,955,053
269 4,955,054
390 4,955,055

CLASS 381

43 4,955,056
63 4,955,057
103 4,955,058
116 4,955,059

CLASS 382

8 4,955,062
18 4,955,063
22 4,955,064
32 4,955,060
50 4,955,065
56 4,955,061
4,955,066
62 4,955,067

CLASS 383

4 4,955,068
67 4,953,987

CLASS 384

8 4,953,988
12 4,953,989
18 4,953,990
19 4,953,991
607 4,953,992
623 4,953,993

CLASS 388

811 4,955,069

CLASS 400

120 4,953,994
121 4,953,995
162.2 4,953,996
616.3 4,953,997

CLASS 401

7 4,953,998
9 4,953,999
68 4,954,000
139 4,954,001
217 4,954,002

CLASS 402

079 4,954,003

CLASS 403

13 4,954,004
24 4,954,008
57 4,954,005
135 4,954,006
172 4,954,007

CLASS 404

6 4,954,009
96 4,954,010

CLASS 405

3 4,954,011
23 4,954,012
25 4,954,013
79 4,954,014
121 4,954,015
184 4,954,016
259 4,954,017
4,954,018
268 4,954,019

CLASS 406

38 4,954,020

CLASS 407

35 4,954,021

CLASS 408

1 R 4,954,022
4,954,023
153 4,954,024
238 4,954,025
241 R 4,954,026

CLASS 409

26 4,954,027
4,954,028

CLASS 419

80 4,954,029

96 4,954,030
110 4,954,031

CLASS 411

289 4,954,032

CLASS 414

27 4,954,033
156 4,954,034
228 4,954,035
295 4,954,036
389 4,954,037
482 4,954,038
500 4,954,039
513 4,954,040
718 4,954,041
4,954,042
719 4,954,043
754 4,954,044
792.7 4,954,045

CLASS 417

53 4,954,046
203 4,954,047
209 4,954,048
234 4,954,049
269 4,954,050
305 4,954,051
331 4,954,052
379 4,954,053
440 4,954,054
477 4,954,055

CLASS 418

55.3 4,954,056
55.6 4,954,057

CLASS 419

9 4,954,313
18 4,954,058
38 4,954,166
45 4,954,314

CLASS 422

31 4,954,315
37 4,954,316
46 4,954,317
59 4,954,318
67 4,954,319
186.04 4,954,320
186.19 4,954,321

CLASS 423

55 4,954,168
95 4,954,322
235 4,954,323
239 4,954,324
328 4,954,325
4,954,326
338 4,954,327
386 4,954,328
410 4,954,329
484 4,954,330
574 R 4,954,331

CLASS 424

5 4,954,348
59 4,954,332
66 4,954,333
68 4,954,334
70 4,954,341
71 4,954,336
73 4,954,337
78 4,954,338
4,954,339
92 4,954,340
070 4,954,335
436 4,954,342
448 4,954,343
4,954,344
450 4,954,345
456 4,954,346
4,954,347
461 4,954,349
493 4,954,350
667 4,954,351

CLASS 425

72.1 4,954,059
85 4,954,060
131.1 4,954,061
135 4,954,062
149 4,954,063
162 4,954,064
175 4,954,065
296 4,954,352
388 4,954,066
406 4,954,067
4,954,068
453 4,954,069
503 4,954,070
531 4,954,071
547 4,954,073
549 4,954,072
556 4,954,074

CLASS 426

5 4,954,353
8 4,954,354
61 4,954,355
107 4,954,356
302 4,954,357
331 4,954,358
557 4,954,359
565 4,954,360
580 4,954,361
602 4,954,362
636 4,954,363

CLASS 427

44 4,954,371
53.1 4,954,365
54.1 4,954,364
68 4,954,366
109 4,954,367
256 4,954,368
388.2 4,954,372
389.9 4,954,373
430.1 4,954,369
438 4,954,370

CLASS 428

34.1 4,954,374
4,954,375
35.7 4,954,376
36.1 4,954,377
63 4,954,378
64 4,954,379
4,954,380
100 4,954,384
116 4,954,381
4,954,382
131 4,954,383
4,954,385
137 4,954,386
138 4,954,387
198 4,954,388
212 4,954,389
4,954,390
220 4,954,391
244 4,954,392
288 4,954,393
289 4,954,394
318.4 4,954,395
340 4,954,396
400 4,954,398
402 4,954,399
412 4,954,401
414 4,954,400
597 4,954,402

CLASS 429

103 4,954,403

CLASS 430

45 4,954,404
58 4,954,397
4,954,405
60 4,954,406
96 4,954,407
108 4,954,408
4,954,409
109 4,954,410
111 4,954,411
135 4,954,413
137 4,954,412
138 4,954,414
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175 4,954,418
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409 4,954,427
495 4,954,428
503 4,954,429
534 4,954,430
546 4,954,431
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CLASS 431

107 4,954,075
116 4,954,076
145 4,954,077
255 4,954,078

CLASS 432

6 4,954,079

CLASS 433

8 4,954,080
53 4,954,081
80 4,954,082

CLASS 434

112 4,954,083

CLASS 435

7 4,954,433
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69.4 4,954,437
78 4,954,438
101 4,954,439
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115 4,954,441
172.3 4,954,442
178 4,954,443
181 4,954,444
184 4,954,446
191 4,954,445
200 4,954,447
232 4,954,448
240.27 4,954,449
252.4 4,954,450

CLASS 436

175 4,954,451
524 4,954,452

CLASS 437

8 4,954,453
21 4,954,454
31 4,954,455
4,954,456
4,954,457
51 4,954,458
228 4,954,459

CLASS 439

29 4,954,084
34 4,954,085
65 4,954,086
71 4,954,087
73 4,954,088
76 4,954,089
4,954,090
103 4,954,091
152 4,954,092
188 4,954,093
244 4,954,099
247 4,954,094
284 4,954,095
346 4,954,096
352 4,954,097
404 4,954,098
492 4,954,100
502 4,954,101
535 4,954,102
751 4,954,103
4,954,104
864 4,954,105

CLASS 440

21 4,954,106
61 4,954,107
73 4,954,108
78 4,954,109

CLASS 441

22 4,954,110
61 4,954,111
64 4,954,112

CLASS 445

58 4,954,113

CLASS 446

75 4,954,114
204 4,954,115
256 4,954,116
280 4,954,117
375 4,954,118

CLASS 455

2 4,955,070
33 4,955,082
47 4,955,083
90 4,955,071
108 4,955,072
161 4,955,073
182 4,955,074
4,955,075
188 4,955,076
197 4,955,077
244 4,955,078
278 4,955,084
325 4,955,079
330 4,955,085
343 4,955,080
605 4,955,086
608 4,955,081

CLASS 464

111 4,954,119
141 4,954,120
162 Re.33,322

CLASS 474

82 4,954,121

CLASS 475

160 4,954,122
179 4,954,123

CLASS 493

195 4,954,124

CLASS 501

80 4,954,460
95 4,954,461
4,954,462
4,954,463
120 4,954,464
134

CLASS 502

5 4,954,465
24 4,954,466
26 4,954,467
63 4,954,468
80 4,954,469
107 4,954,470
110 4,954,471
152 4,954,472
171 4,954,473
185 4,954,474
343 4,954,475
350 4,954,476

CLASS 503

226 4,954,477
227 4,954,478

CLASS 505

1 4,954,479
4,954,480
4,954,481

CLASS 514

8 4,954,482
9 4,954,483
30 4,954,484
49 4,954,485
158 4,954,486
159 4,954,487
174 4,954,491
176 4,954,490
177 4,954,488
188 4,954,492
195 4,954,489
4,954,493
210 4,954,494
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231.5 4,954,496
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CLASS 521

82 4,954,533
157 4,954,537

CLASS 522

28 4,954,534

CLASS 523

139 4,954,535
149 4,954,536
223 4,954,538

CLASS 524

27 4,954,539
86 4,954,540
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89 4,954,542
104 4,954,543
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158 4,954,545
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271 4,954,550
327 4,954,551
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376 4,954,553
378 4,954,556
399 4,954,555
4,954,557
507 4,954,559
714 4,954,560
728 4,954,561
779 4,954,562
813 4,954,564
860 4,954,565

CLASS 525

61 4,954,566
62 4,954,567
92 4,954,568
146 4,954,569
185 4,954,570
205 4,954,571
285 4,954,572
327.6 4,954,573
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330.5 4,954,575
339 4,954,576
420 4,954,577
432 4,954,578
460 4,954,558
467 4,954,579
476 4,954,580
497 4,954,581
502 4,954,582
507 4,954,583
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CLASS 526

138 4,954,125
220 4,954,585
245 4,954,586
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247 4,954,588
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259 4,954,590
264 4,954,591
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270 4,954,593
320 4,954,594
344.2 4,954,595

CLASS 528

14 4,954,596
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22 4,954,598
38 4,954,599
45 4,954,601
89 4,954,600
93 4,954,602
98 4,954,603
125 4,954,604
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230 4,954,607
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353 4,954,609
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388 4,954,554
483 4,954,614
501 4,954,615

CLASS 530

333 4,954,616
387 4,954,617
4,954,618

CLASS 534

783 4,954,563

CLASS 536

20 4,954,619
56 4,954,620
119 4,954,621
127 4,954,622
4,954,623

CLASS 540

225 4,954,624
500 4,954,625

CLASS 544

102 4,954,630
105 4,954,626
182 4,954,627
211 4,954,628
237 4,954,629

CLASS 546

15 4,954,631
194 4,954,632

CLASS 548

240 4,954,633
341 4,954,634
354 4,954,635
475 4,954,639
490 4,954,640
519 4,954,636
546 4,954,637
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CLASS 549

384 4,954,641
389 4,954,642
531 4,954,643

CLASS 556

14 4,954,644
45 4,954,645

CLASS 558

31 4,954,646
46 4,954,647
425 4,954,648

CLASS 560

180 4,954,649

CLASS 562

534 4,954,650
856 4,954,651

CLASS 564

223 4,954,652
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446 4,954,654
464 4,954,655

CLASS 568

567 4,954,656
584 4,954,657
617 4,954,658
651 4,954,659
697 4,954,660
727 4,954,661
779 4,954,662
791 4,954,663
864 4,954,664
902.2 4,954,665

CLASS 570

132 4,954,666

CLASS 600

36 4,954,126
4,954,127

CLASS 604

5 4,954,128
53 4,954,129
169 4,954,130

CLASSIFICATION OF DESIGNS

D1—	102	310,285		500	310,311		39	310,337		129	310,363		41	310,389		38	310,415
	126	310,287		596	310,312		40	310,338		138	310,365	D21—	13	310,390		40	310,416
D2—	29	310,286		604	310,313		46	310,339			310,366		17	310,391		48	310,417
	211	310,288		611	310,314		50	310,340		163	310,364		24	310,392			310,418
	283	310,289	D7—	554	310,315		71	310,341		217	310,367		32	310,393	D25—	22	310,420
	314	310,290		590	310,316	D12—	14	310,342		228	310,368		59	310,394		113	310,421
		310,291		700	310,317		98	310,343		258	310,369		114	310,395	D26—	4	310,422
		310,292	D8—	95	310,318		148	310,344			310,370			310,396		35	310,423
		310,293		350	310,319		185	310,345			310,371		128	310,397			310,424
	317	310,294			310,320		192	310,346		299	310,372		130	310,398		49	310,425
	320	310,295		354	310,321		193	310,347	D15—	1	310,373		141	310,399		138	310,426
D3—	33	310,297		382	310,322	D13—	114	310,348		15	310,374		148	310,400	D27—	154	310,427
		310,298		395	310,323		168	310,349		133	310,375		174	310,401	D28—	48	310,428
		310,299		399	310,324	D14—	100	310,350		140	310,376	D22—	122	310,402		49	310,430
	34	310,300	D9—	336	310,325		103	310,351	D16—	101	310,377		134	310,403		51	310,429
		310,301		337	310,326		105	310,352		107	310,378	D23—	213	310,404	D29—	8	310,431
	38	310,302		341	310,327		106	310,353		124	310,380		226	310,405		9	310,432
	40	310,303		385	310,328		109	310,354		136	310,381		263	310,406		10	310,433
		310,304		409	310,329			310,355		209	310,382		301	310,407		13	310,434
	61	310,305		410	310,330		113	310,356	D17—	107	310,379		348	310,408	D30—	152	310,435
		310,306	D10—	32	310,331			310,357	D18—	1	310,383		351	310,409		161	310,436
	301	310,296			310,332			310,358		12	310,384		354	310,410	D32—	15	310,437
D4—	104	310,307			310,333			310,359	D19—	3	310,385			310,411		22	310,438
	108	310,308			310,334		126	310,360		10	310,386		359	310,412		70	310,439
D6—	455	310,309			310,335			310,361	D20—	6	310,387	D24—	17	310,413	D99—	17	310,419
	457	310,310			310,336			310,362		10	310,388		34	310,414			

CLASSIFICATION OF PLANTS

P.—	1	7,312															
	24	7,313		47	7,314		68	7,318		74	7,315		86	7,316		88	7,317

STATUTORY INVENTION REGISTRATIONS

99—	467	H813	252—	49.6	H815	324—	627	H821	429—	86	H816						
250—	504 R	H820	277—	34.3	H814	330—	4.3	H822	430—	544	H817	525—	333.9	H818	530—	389	H819

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
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Guam	14	New Jersey	34	West Virginia	54
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Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,953,320
4,953,476
4,953,797
4,953,804
4,953,981
4,954,018
4,954,134
4,954,155
4,954,156
02 : 4,953,766
04 : 4,953,314
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DESIGN PATENTS

01 :	310,378		310,368		310,435		310,290	34 :	310,297		310,320
	310,379		310,382	13 :	310,387		310,293		310,309		310,349
04 :	310,381		310,385		310,438		310,294		310,407		310,375
	310,401		310,386	17 :	310,296		310,295		310,428		310,425
	310,418		310,405		310,303		310,356	36 :	310,330	44 :	310,306
05 :	310,302		310,414		310,305		310,357		310,384	46 :	310,317
	310,426		310,415		310,351	26 :	310,327		310,395	48 :	310,338
06 :	310,307	08 :	310,304		310,421		310,343		310,396		310,388
	310,312	09 :	310,315		310,433		310,369	39 :	310,322		310,400
	310,321		310,394	18 :	310,324		310,370		310,362		310,410
	310,323	12 :	310,311		310,413		310,371		310,380		310,411
	310,335		310,314		310,420		310,432		310,397	49 :	310,310
	310,336		310,326	20 :	310,372	27 :	310,339		310,404		310,346
	310,347		310,345	22 :	310,288		310,403		310,424	55 :	310,374
	310,354		310,367		310,419	28 :	310,422	41 :	310,291		310,390
	310,355		310,423	24 :	310,437	29 :	310,301		310,292		310,417
	310,358		310,434	25 :	310,287	32 :	310,300	42 :	310,319		310,436

PLANT PATENTS

06 :	7,315	13 :	7,314	39 :	7,316						

STATUTORY INVENTION REGISTRATIONS

24 :	H816	36 :	H819		H815						
34 :	H818	48 :	H813	51 :	H820		H821		H822	53 :	H814

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